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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLIX NEW YORK—THURSDAY, NOVEMBER 22, 1923 No. 21

Motor Vehicle Taxation Formula Accepted by Railroads

Committee Appointed by U. S. Chamber of Commerce Files Report. Highway Maintenance and Special Common Carrier Levy Advocated.

DEFINITE principles for the taxation of motor vehicles are laid down in the report of the joint sub-committee appointed by the Chamber of Commerce of the United States to study the taxation of transportation agencies. On this subject, the committee says:

> **"Since the motor vehicle derives a special benefit from the improved highway, your committee believes that it should bear the entire expense of maintaining these roads in as good condition as when they were built, even where this involves resurfacing or reconstruction of the same type of road.**
>
> **"In addition to a maintenance tax, highway transport common carriers should pay a tax in exchange for franchise rights comparable to those owned by other carriers.**
>
> **"By paying the cost of maintenance of the highways which it uses, the motor vehicle puts itself on an equality as to maintenance with the steam and electric railways, which pay for the maintenance of their own way and structures through direct charges to operation instead of by taxation."**

All forms of transportation were represented on the committee, which included:

George A. Post, chairman, president Geo. A. Post Co., Inc., New York.

A. J. Brosseau, president Mack Trucks, Inc., New York.

Roy D. Chapin, chairman of board, Hudson Motor Car Co., Detroit.

W. R. Cole, president Nashville, Chattanooga & St. Louis Railway, Nashville.

Gerrit Fort, vice-president Boston & Maine Railroad, Boston.

Philip H. Gadsden, vice-president United Gas Improvement Co., Philadelphia.

W. H. Maltbie, attorney-at-law, chairman committee on special taxes, American Electric Railway Association, Baltimore.

Acceptance of these principles by steam and electric railroads would mean that there could be no future outcry over favoritism toward competing highway transport on the ground that it is provided with a roadbed free of charge. It is significant, also, that the report does little more than reaffirm the highway taxation platform previously adopted by the automotive industry.

The report follows:

THE problem laid before your committee is to formulate and recommend a proper basis of taxation to be applied to rail and highway transportation. It is not within the province of the committee to discuss whether or not our general tax structure is sound or whether or not transportation is paying more or less than its fair share of the operating expenses of our Federal, State and local governments. The specific question assigned the committee, however, can hardly be answered without due consideration of the forms and amounts of taxation paid by each of these transportation agencies.

During the past ten years the taxes paid by transportation agencies have increased enormously. In 1913 the Class I steam railroads of the country paid $118,386,859 in taxes, as compared with $322,300,406 paid out in dividends. In 1921 these railroads paid $275,875,990 in taxes and $298,511,328 in dividends. The taxes exceeded the dividends in 1920 and in 1922.

The steam and electric railways and motor transport in 1921 paid more than 8 per cent of the nation's total taxes of approximately $9,000,000,000. In addition to these amounts these agencies were and are subject to numerous local imposts and special taxation amounting to considerable sums.

In the case of steam and electric rail carriers expenses for maintenance of way and structures are charged to operating expenses and are paid out of the rates charged for service. It is obvious. however, that highway maintenance can only be paid for by means of taxation, since the roads are public highways open to all.

A. J. Brosseau, president Mack Trucks, Inc., was one of the automotive representatives on the committee

Reports of the Interstate Commerce Commission, the American Electric Railway Association and the Joint Commission of Agricultural Inquiry indicate that:

(*a*) In addition to the taxes paid by Class I steam railroads in 1921 amounting to $275,875,990, they expended $756,413,690 in the same year for maintenance of way and structures, charging the sum to operating account.

(*b*) Electric railways paid $92,033,000 in taxes and imposts in 1921. In addition they paid approximately $101,000,000 for maintenance of way and structures, charging the sum to operating account.

(*c*) Motor vehicle owners, as one element in highway transport, paid in 1921 on the vehicles $75,000,000 in personal property taxes, $115,500,000 in special Federal excise taxes, $147,000,000 in special taxes applied directly to the construction and maintenance of public highways, and in addition large sums in various municipal taxes, corporation and business income taxes and other property taxes for which no figures are available. Among these latter are included the taxes on garages and other facilities for 13,000,000 motor vehicles.

Specific Need of Common Carriers

Consideration of the different methods of taxation in ordinary use leads to the conclusion that it is impossible to recommend any one of them as ideal or equitable for the taxation of common carriers.

A frequent method of taxation of common carriers is ad valorem taxation; that is, a taxation rate applied to an investment or valuation basis. This is largely an attempt to apply the old general property tax, in use in the early days of this country for the taxation of lands and of simple personal property, to complex and widely distributed economic units, manifestly in form unfitted for such methods of taxation.

It is now admitted by most taxation experts that the most equitable method of taxation for public utilities is that based upon earnings or income.

Graduated Tax Suggested

A graduated tax on gross earnings depending on the relation of net to gross was recommended by the New York State Committee on Taxation and Retrenchment, in its report submitted March 1, 1922. This system has been designated the "gross-net" tax, and your committee recommends it as sound in principle and one which should be applied to steam and electric railways and as far as practicable to motor vehicle common carriers.

The details of such a tax scale would have to be worked out with much care in order that each form of transportation shall bear its just share of the requirements for public expenditures.

Such a tax has the elements of a sound tax, in that it has certainty, reasonableness and simplicity, while at the same time the State in each case will be assured of at least some revenue from each corporation.

This tax as applied to steam railroads and electric railways should replace the multiplicity of taxes at present levied upon them, including Federal taxes on capital stock and income, and the various State and local taxes, such as franchise taxes (of different forms in each State), ad valorem taxes, taxes on gross earnings and on capital stock, annual licenses, special franchises, local real estate and personal property taxes. The gross-net tax should replace all of these taxes.

There are undoubtedly difficulties to be overcome in the application of the gross-net tax system. One of these is the allocation to the various political units of the gross and net earnings of interstate carriers on which the tax must be computed. Your committee believes that an equitable method of allocation can be devised.

Under the diverse bookkeeping methods employed by the small companies and by individuals who comprise the bulk of the highway transport common carrier operators of today, practical administration of a gross-net tax is impossible. Pending common carrier regulatory control which will place the earnings of these carriers upon a comparable basis for taxation, your committee believes that such increases should be made in the taxes now levied against the common carrier motor vehicle as will bring its charges to an amount equitably proportionate to those that may be assessed against the other carriers.

It is recognized that this recommendation segregates common carrier motor vehicles not only from private cars which have no gross or net earnings, but also from motor trucks used as private carriers and not subject to public control.

There still remains to be considered the relation of all transportation agencies to the cost of construction and maintenance of highways. The sources of money for the highway program of 1921, according to the U. S. Bureau of Public Roads, may be summarized as follows:

AMOUNT AND SOURCES OF HIGHWAY BUDGET, 1921

Source	Amount	Per Cent
Bonds	$417,817,208	39.0
General State and local taxation	381,091,542	43.9
Miscellaneous	88,919,158	
Gasoline tax and registration fees	109,154,226	10.2
Federal and forest road aid	74,679,897	6.9
Total	$1,071,662,031	100.0

Thus it is apparent that, leaving out revenue from bonds, which are a capital expenditure, the tax charge for highways in 1921 was $653,844,823, which constitutes only 7.3 per cent of the total of all general and miscellaneous taxation of the country. Of the $653,844,823, the sum of $183,000,000 came from special taxes assessed against the motor vehicle and the balance from general and miscellaneous taxation.

The disposal of this fund, as compiled from the records of the Bureau of Public Roads, is as follows:

TOTAL HIGHWAY EXPENDITURES, 1921

A—States:		
Construction	$271,462,565	
Maintenance	60,418,182	
Administration, engineering, etc.	16,642,902	
Interest, principal and sinking funds on bonds	20,023,037	
Total States		$368,546,686
B—Counties:		
Construction and maintenance	$458,304,295	
Administration, engineering, etc.	113,375,197	
Total counties		571,679,492
C—Federal and forest road aid		103,142,571
D—Balance carried over		28,293,282
Grand total		$1,071,662,031

Cooperation Needed

Your committee frankly accepts the motor vehicle as an essential addition to the transportation agencies required in our modern economic life. It follows that improved roads to carry the motor vehicle are equally necessary. These highways are free to the general public, and are built out of general public funds just as are schools, parks and many other improvements essential to the public health and welfare.

In the case of steam and electric railways the investment in roadway is a capital account, and returns on this investment are paid out of income, but on the other hand the steam and electric railways have certain franchise rights in the use of their roadway. Since the motor vehicle derives a special benefit from the improved highway, your committee believes that it should bear the entire expense of maintaining these roads in as good condition as when they were built, even where this involves resurfacing or reconstruction of the same type of road. In addition to a maintenance tax, highway transport common carriers should pay a tax in exchange for franchise rights comparable to those owned by the other carriers.

By paying the cost of maintenance of the highways which it uses, the motor vehicle puts itself on an equality as to maintenance with the steam and electric railways, which pay for the maintenance of their own way and structures through direct charges to operation instead of by taxation.

350,000 Miles of Improved Roads

There are now in the country about 350,000 miles of improved highway. A large part of this mileage has been built by the various State highway departments with Federal aid as part of a coordinated system. Many counties have also amplified the system by equally substantial roads. There are, however, some 2,450,000 miles of unimproved roads. Many of these roads are little better than trails and not suited to motor vehicular traffic. The maintenance of them by counties and towns often results in little more than keeping them passable, and yet the aggregate expense is large.

Your committee does not believe, therefore, that the motor vehicle should be burdened with a special tax for the maintenance of roads not suitable for motor use.

Waste Elimination Urged

Your committee would not perform its full duty did it not recommend that all possible influence should be brought to bear to eliminate wasteful, extravagant or unnecessary expenditure from the highway program, which should always be subject to centralized, coordinated administration.

Roy D. Chapin, president Hudson Motor Car Co., was the other automotive representative

Specific Recommendations

In conclusion your committee makes the following recommendations:

1. Each form of transportation should bear its fair share of the burden of public expenditure.
2. Taxation of common-carrier transportation agencies should be simplified as far as possible.
3. Taxes on regulated common carriers operated for hire should bear a definite relation to gross and net earnings rather than to invested capital.
4. This requirement can best be met in the case of steam and electric rail common carriers by the imposition of a gross-net tax in lieu of the present levies. Pending full regulation of the motor common carrier, such increases should be made in taxes now levied against it as will bring them an amount equitably proportionate to that which may be assessed against the other carriers.
5. The entire cost of maintaining the improved highways of the country should be borne from special taxes levied against the road user. Such taxes should be used for no other purpose.
6. Coordination of highway construction and maintenance under centralized administrative agencies is urged to eliminate waste and secure efficiency.

Gear Production Troubles and Methods Discussed by Engineers

Frankness characterizes opinions expressed at S. A. E. Detroit Section meeting. Disagreement developed about final method of finishing; some favor grinding, while others prefer lapping and polishing. Electric hardening furnace equipment praised.

AN unusual amount of practical information was developed at the first production meeting of the Detroit Section of the Society of Automotive Engineers. Gears were discussed from every angle by representatives from several engineering, production and inspection departments. The outstanding feature of the meeting was the utter frankness which characterized the remarks of each speaker. Difficulties, mistakes and their correction were given almost as much prominence as the progress made by newer developments of equipment and process. Steel structure, forging methods and preliminary machine operations were not overshadowed by the emphasis which has more recently been placed on the final gear finishing operations.

The attention which gears have received recently has developed some general trends, chief among which is an increasing departure from the low carbon steels requiring carburizing treatment toward higher carbon contents which permit direct oil quenching or treatment. The quality of the higher carbon steels has been found to be more consistent and distortion is greatly decreased. Distortion has been further eliminated by using upset gear blanks rather than blanks forged from a flat bar.

In the blank which has been upset from a round bar, the flow lines developed in the rolling process are radial and extend along the axes of the individual teeth. In the flat bar blank, these flow lines pass through the teeth which are formed parallel with the length of the bar, but extend across the teeth which are at right angles to the longitudinal axis of the original bar. The teeth of the upset blank are of uniform strength, while those of the flat bar blank vary between wide limits, depending on the location of the finished tooth as related to the longitudinal axis of the original bar.

Opinions Differ on Finishing

Considerable divergence of opinion developed as to the final method of finishing gear teeth. Some speakers were enthusiastic over the grinding process, while others indicated a decided preference for lapping and polishing methods. Throughout the meeting it was pointed out that more careful preliminary work and better tool and cutter inspection methods have a great bearing on the uniformity of the final product with any method of producing the finished tooth. Practically every speaker commented on the advantages of the electric hardening furnace, stating that the great burden of the trouble caused by erratic heats, scaling and distortion had been eliminated upon the adoption of this equipment.

The fundamental characteristics of sound and, therefore, noise, were discussed in the first paper by W. R. Griswold of the Packard Motor Car Co. Sources of sound, its vibrational characteristics and transmission through various mediums were discussed from a combined theoretical and practical standpoint. Griswold stated that in a broad way the noise characteristics of the gear box might be improved by four lines of effort, as follows:

1. Redesign of shafts, gears, bearings and inclosure to minimize the elastic or deflective characteristics of each of these elements.
2. Increase of skill through improvement of all processes from the rolling mill to the finished car.
3. Determination of basic causes and analysis of their manifestations to produce the desired effect.
4. Application of partial control and corrective methods, such as grinding. In other words, selective combinations of the first three methods.

Effects of Heat Treatment

In the next paper, which was illustrated by graphic charts, O. H. Schafer of the Studebaker Corporation described the effects of heat treatment on low carbon carburized gears. His charts indicated that while the green gear had excellent uniform spacing and involute characteristics, carburizing introduced errors which were further amplified by the hardening and heat treatment. In general, the teeth shorten radially and swell along the pitch line. This action also tends to modify the tooth spacing. The advantages of more careful cutting were pointed out. Schafer commented very favorably on the simplified gear hobbler as built by the Cincinnati Gear Cutting Machine Co., stating that rigid support of the work and positive indexing and cutter drive are salient necessities for the production of good gears.

The experience of the Cadillac Motor Car Co. with ground gears was outlined by L. A. Danse. Before ground gears were adopted about 30 per cent of the gear boxes had to be torn down at the cost of $2.50 each in order to reduce noise. At present tear-downs are running less than 5 per cent per day and only a small portion of these are reworked due to gear noise. Allowable backlash has been reduced by at least 50 per cent and true involute forms are maintained. Finished scrap has been reduced from approximately 3 per cent to less than ⅛ per cent. Formerly Cadillac gears were rough hobbed and finished by two cuts in gear shapers, the final cuts being slow and laborious. At present blanks are hobbed 0.020 in. oversize and shaped to 0.005 oversize and finally ground to size, approximately 0.0025 in. being removed from each side of the individual tooth.

Three gear shapers operated by one man are now handling the work formerly scheduled for six shapers and two men. Twenty-nine Lees-Bradner grinders are required for the production of 105 cars per day, six gears com-

prising 139 teeth being ground on both sides. The gears are 6 diametral pitch and the average width of face is approximately ⅞ in. Production on the smaller gears runs from 55-60 pieces per nine-hour day and 38-44 pieces for the larger gears. Norton 3850-H vitrified alundum wheels are used, the original diameter being 30 in. and the final worn-out diameter 22 in. The surface of the wheel is redressed after every two complete grinding operations, the amount taken off being 0.0002-0.0003 in. Scrap diamonds from the cylindrical grinding department are used, each being capable of from one to three months service in the gear grinding department.

Danse emphasized the importance of relieving the shaped contour of the tooth so that the outer edge of the grinding wheel is not required to make a heavy cut. The Fellows shaper cutters are modified so that the 0.0025 in. grinding allowance practically vanishes at the effective root of the tooth. Otherwise the outer edge of the wheel wears rapidly and produces teeth which are not correct in shape. At this point he stated that Cadillac had found the true involute contour of 20 deg. pressure angle to be most satisfactory.

Cadillac Metallurgical Standards

From the metallurgical angle, Cadillac have standardized S. A. E. 3250 steel, oil treated, for all of their transmission gears after having experimented extensively with steels ranging from 0.05-0.65 per cent carbon and a wide range of alloys. This steel produces the happy combination of requisite safety factors and simple, dependable heat treatment. All Cadillac gears are upset from the round bar to insure uniform tooth strength and minimum distortion.

A series of impact tests showed that the strength of teeth cut in blanks forged from the flat varied within a wide range. Teeth cut in the flow line of the raw bar were very strong, while teeth cut at right angles to the axis of the bar were weak. The two teeth in the flow line of the flat bar blank are stronger than those of the upset gear, but the teeth of the upset gear are uniformly 100-400 per cent stronger than the average of all the teeth in the gear made from the flat bar. Furthermore, any distortion of the upset gear during heat treatment is uniform and in one direction, while the flat bar gear tends to go back to its original rectanagular characteristics and therefore varies in unforesoon ways.

Much of the success in the Cadillac gear line is attributed to the electric hardening furnace equipment. Heats are uniform and correctly timed, scale and distortion are minimized. From the service angle a vast improvement has been shown since the adoption of the ground gears. The chief advantages already shown are much greater life and improved wearing quality, both of which are conducive of continuous quiet operation.

Different Method Advocated

A somewhat different viewpoint was presented by R. E. Linn of the Lincoln Motor Co., who advocated burnishing before and polishing after hardening as a successful commercial method of producing quiet transmission gears. He stated that his company was producing gears of very smooth tooth finish by changing the cutting angle of Fellows cutters from the usual 5 deg. to 13-18 deg. Although this treatment changes the pressure angle slightly, a much better shaving cut is made, which leaves a smoother, brighter finish. The variation in pressure angle is immaterial when all teeth are cut by the same method. After machining, the gears are burnished in a three gear combination by running them 5 sec. in each direction.

Each of the three master gears has different characteristics, so that the entire tooth face of the production gear is treated. One of the master gears is made with a different pressure angle to eliminate the neutral point at the pitch line which would be present if both gears were of the same pressure angle. Following the oil treatment of the high carbon steel, the teeth are polished by a light flexible rubber wheel which replaces one tooth flank of a rack in which the production part is rolled. This wheel is charged with emery or Tripoli cake and, as it is flexible, is used as a polishing rather than a grinding element. Linn stated that he had found this method satisfactory for the production of smooth tooth contour surfaces, which he regards as an outstanding factor in quiet operation.

Distortion Due to Steel Structure

Abnormal steel structure was charged as being the offender responsible for a great share of gear distortion difficulties by W. G. Hilsdorf of the Reo Motor Car Co. He stated that low carbon steels in the carburizing range show greater variation in this respect and therefore a greater tendency toward localized soft spots and distortion than the higher carbon steels. This variation is very marked even in successive heats from the same mill. Due to this difficulty, he averred that his company is seriously anticipating a change to higher carbon steels and oil treatment.

Hilsdorf also described a novel method of checking gear shaper cutters which has had a great influence in improving tooth contour and spacing. When the cutters are received they are first put over a comparator and checked for spacing and contour against master charts. Due to the cooperation of the cutter manufacturers, the error at this point is found to be very slight. The cutters are then used to cut two gears in the standard gear shaper which are in turn rolled together with corresponding generated surfaces in contact with each other. During this process the tooth contours are checked by a micrometric contour measuring instrument. Limits of error are held to 0.0002 in.

Careful Inspection

This same policy is more stringently in force after the cutters have been reground. Upon the least indication or suspicion of error the worn cutter is again used to cut two checking gears which are checked as previously described. Each cutter is numbered and the machine in which it is in operation bears a tag showing this number. A complete card index is maintained showing the history and condition of each cutter up to date.

The Reo Motor Car Co. maintains a selective inspection system and grinds all gears which vary from very close limits. The first grade of gears and the ground gears are placed in gear boxes for closed cars. The second group are placed in open car gear boxes. As yet no ground gears have been used in the Speed Wagon transmission. Hilsdorf also gave great credit to the electric furnace, stating that normal steel could be processed through this type of furnace with every assurance of maintaining consistent preconceived standards. He also emphasized the advantages of the upset gear in the same manner as Danse, a former speaker.

In the furnaces used at the Reo plant ring gears are fed through directly on the standard roller equipment. Transmission gears are carried through the furnace on steel plates. By drilling 1 in. diameter holes ⅜ in. apart in these plates the current cost was reduced from 0.3 to 0.26 cent per lb. Before the plates were drilled they warped rather badly. After drilling this tendency completely disappeared.

The problems of the traffic transmission as made by the Chandler Motor Car Co. were discussed by A. H. Frauen-

thal, who advocated a burnishing process somewhat similar to that described by Linn of Lincorn. Chandler, however, has not found it necessary to rotate the gear in both directions, as a light pressure is applied during the operation. This company is using steel of 0.47-0.53 carbon and 0.80-1.10 per cent chromium content after having discarded the low carbon carburizing stock. Attempts toward modifying the tooth form in the burnishing process were made, but any modification of the form is now made at the cutting operation. The tooth surface must not be stressed too greatly in the burnishing operation, as undue deformation occurs in hardening. Frauenthal stated that the burnishing process could be overdone, with very great consequent damage, although he had found that the teeth could be further improved by reprocessing in the same machine following heat treatment.

Smooth tooth contact surface with fairly accurate spacing have been found essential to produce quiet operation of the constant mesh gears that characterize this transmission. Another unusual feature involved in this construction which has improved silence is obtained by making the smaller of two meshing gears with the standard tooth width and allowing all the backlash in the larger gear. Frauenthal inferred that quietness was a matter of degree and frankly stated that the big problem of the medium priced car manufacturer was to produce gears that were as quiet as those of competitors and still maintain cost within the proper commercial range. He stated that the greatest contribution to this effort was made in the Chandler plant by "jacking up" every operation along the line from the forging process onward. This policy has not made any inordinate increase in costs but has resulted in a great improvement of general practice and finished results.

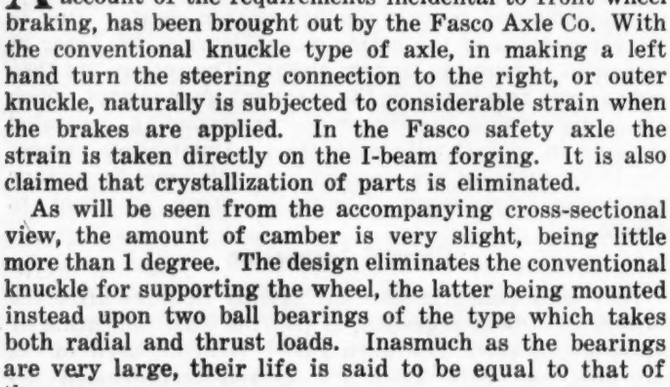
In commenting on Chandler practice, K. L. Herrmann, the chairman of the meeting, stated that the adequate silence room facilities at the Chandler plant had shown new possibilities in the way of detection of bearing noises, etc. A complete brick inclosure which is isolated from any other part of the shop permits the utmost silence and has already demonstrated that in the near future attention must be given to other than gear noises. He also bore out the statement of Griswold, that much remains to be done to minimize the resonant qualities of the gear case proper.

Unusual Design in New Front Axle

A RATHER unusual design of front axle, which takes account of the requirements incidental to front wheel braking, has been brought out by the Fasco Axle Co. With the conventional knuckle type of axle, in making a left hand turn the steering connection to the right, or outer knuckle, naturally is subjected to considerable strain when the brakes are applied. In the Fasco safety axle the strain is taken directly on the I-beam forging. It is also claimed that crystallization of parts is eliminated.

As will be seen from the accompanying cross-sectional view, the amount of camber is very slight, being little more than 1 degree. The design eliminates the conventional knuckle for supporting the wheel, the latter being mounted instead upon two ball bearings of the type which takes both radial and thrust loads. Inasmuch as the bearings are very large, their life is said to be equal to that of the car.

The end of the I-beam is forged with an inclined boss, so that the pivot pin axis when extended meets the ground in a point slightly ahead of the center of ground contact of the wheel and, therefore, gives a trailing effect. This castor-like action is said to materially help the car in holding the road whenever the front wheels strike an obstacle. It also makes for easier steering, as shocks imparted to the road wheels under these conditions are not transmitted to the steering gear.



Fasco front axle embodies novel features

Referring to the sectional view, *A* is the pivot pin, which is made tubular and clamped in place by a capscrew in the end of the I-beam forging. The pivot pin fits into bushings held in the casting *C*, upon which latter are mounted the inner-races of the ball bearings *B*. The brake carrier is held to *C* by screws *F*. The brakes are of the internal expanding type and completely housed in. The brake cam *G* is connected by a universal joint *H* to the operating shaft *J*. The inner end of the shaft carries a block, *K*, which, while it is free to slide in sleeve *L*, is constrained to rotate with the sleeve when the latter is oscillated by means of lever *M*, as in applying and releasing the brakes.

There is an Alemite fitting on the sleeve support for lubricating the block, and a leather boot keeps the lubricant in and the dust out. Another boot is fitted over the universal joint at the brake end of the operating shaft. There is also an Alemite fitting on the hub for forcing lubricant into it.

Inasmuch as the pivot pins at opposite ends of the axle are practically parallel, the tie rod is provided with yoke and pin type joints, there being no need for the ball joints usually fitted to front axles for front wheel braking.

Molding Sand Investigated

IN connection with the investigation which the Bureau of Standards has been carrying out on foundry molding sand, some interesting work is now under way on the effects produced by adding clay and silica sand, ranging from 10 to 50 per cent, and variable amounts (4 to 10 per cent) of water, to a used foundry sand. It has been shown by the test methods in use that by adding 40 per cent of clay and 25 per cent silica sand to the used sand, and tempering the batch with 8 per cent of moisture, a bond strength and permeability can be attained equal to that of a good brass molding sand. Further tests are in progress to determine the best methods for removing sea-coal and other undesirable impurities from a used foundry sand.

Piece Work Superior to Differential Premium Wage Payment

Simplicity, incentive Value and flexibility Favor former method.

By Louis Ruthenburg

FACTORY managers have often debated the question of wage payment methods. The relative value of the piece work and the differential premium systems often have been up for discusssion. In this brief article, a prominent production man of long experience gives his reasons for favoring the former plan under most circumstances.

ONE is apt to conclude that any wage payment system is successful or not on the basis of his knowledge of its development in given organizations, and there is no question but that any system, properly administered, will work out to better advantage than any other system badly managed.

Probably the greatest single element in the success of any incentive system lies not so much in the system itself as in the spirit in which it is administered. If the faith and enthusiasm of the people working under any system can be enlisted, the system is very apt to work out successfully. If the faith and enthusiasm of the worker are not enlisted, the results of even the most nearly perfect incentive system will always prove disappointing.

Assuming that these basic factors are taken into account, it is my conviction that, other things being equal, the piece work system has many points of decided advantage over any scheme of premium payment.

Low Cost Is Objective

Obviously the primary objective of any incentive system of payment is to attain low cost—first, by reducing the direct labor cost of the product and, second, by attaining distribution of fixed charges and expense over a maximum amount of product.

In order that this objective may be attained, an incentive system should first be examined to see how well it may be expected to operate toward fostering and retaining the good faith of the workmen who will be affected. For two very definite reasons, this can best be attained by piece work.

The first reason is that the most ignorant workman in the shop can readily figure his earnings under a piece work system. This cannot be said of any differential premium system. It is true that by reference to a chart almost any workman can find what the management says his earnings should be at a given rate of efficiency under a premium system, but this is quite a different matter in the workman's mind from figuring out his own earnings and he is very apt to be suspicious of the management's motives if he cannot figure for himself his own earnings.

The second reason is that most differential premium systems pay the workman on a progressively reduced scale in proportion to pieces produced as his efficiency increases. This is fundamentally unfair. From a practical standpoint, this fact is important because the workman readily sees the unfairness of payments made at a progressively reduced rate per piece as his efficiency increases. The average workman under the differential premium system will soon find the point at which his earnings begin to be badly affected by the diminishing rate of return and will strike a pace just short of this point.

Flexibility Essential

The next desirable element in an incentive system is flexibility. Certain operations in most manufacturing shops can be handled to the greatest advantage only by paying the individual operator an individual price. Other operations lend themselves best to grouping. The piece work scheme is equally applicable and will apply equally well to a large or small group. The same thing cannot be said of all differential premium systems.

It is important to note in connection with group incentive schemes that the group should always be kept sufficiently small so that the individual operator does not feel that his influence counts for very little in the group as a whole.

Another important element of any incentive system is that it should involve the least complicated and least expensive accounting. No differential premium system can be handled as economically from an accounting standpoint as simple piece work.

An incentive system should be such that it will not only keep the workers themselves "on their toes" but will serve also as an incentive to good work on the part of the rate-setting department and the supervision generally. The differential premium system, partly on account of its differential feature and partly because the operator tends to strike a pace as previously pointed out, tends to protect the rate-setting department and the supervision when rates are improperly set. A piece work operator under proper guarantees will earn all he possibly can and if the rate has been loosely set the fact will soon be exposed. This fact serves as a powerful incentive for the rate department to exercise care in setting their rates and for the supervision not to approve rates until they are satisfied that they have been properly studied.

Piece rates should be guaranteed religiously under any system whatsoever and the shop administration should be trained to understand that the guarantees are to be respected. A guarantee of one year's duration works out very well.

Just Among Ourselves

Movie Director Gets Real Good Roads Lesson

A MOTION picture depicting what the modern highway means in the life of a farm boy is being made at the expense of the Ford Motor Co. and the Highway Education Board, while the N. A. C. C. and the Bureau of Public Roads are cooperating in the work. The pictures are being shot in the vicinity of Washington. The first scenes were laid in the beautiful setting of Fairfax, Va., and the director, a more or less temperamental person, started out there with two truck loads of equipment and actors. All went well until they became mired in the Virginia roads. The trucks sank lower and lower in the mud while the drivers struggled vainly. Then the director hired a four-horse team to haul them out. His interest in better roads increased immediately and he agreed that they must be an important factor in the farm boy's life.

Bankers Are Not Seeking Fountain of Youth for Cars

A STORY is going the rounds in Wall Street that bankers with automotive connections are much perturbed over the reported assertion of a prominent engineer that use of balloon tires would double the life of an automobile. As the story is told, a conference of these bankers was called to consider the situation which would result from discovery of this Fountain of Youth for motor cars. The bankers, it is asserted, frankly admitted that they didn't want automobiles to live any longer than they do now because if they are given a greater span of years the number of purchasers will be automatically reduced. We don't vouch for the truth of the yarn but if any alarm is felt in financial circles it doubtless is a waste of nervous energy. Balloon tires may make possible the construction of lighter cars than are in use today but they scarcely will prolong the life of these vehicles to an alarming degree.

Automotive Research Deserves Aid of Industry

THE automotive power plant section of the Bureau of Standards deserves the support of the industry. Like most governmental activities it is handicapped by a lack of funds and has to proceed on an economical, not to say frugal, basis. The value of the research it has conducted has been demonstrated many times in the past. It is now a good many thousands of dollars in the hole and the estimates for it in both the regular and supplemental budgets of the Department of Commerce for the next fiscal year amount to only $50,000. If it is not given at least this amount it will be necessary to reduce the personnel. While it has been contended in some quarters that much of the work which is done by the section could be done with equal facility in the laboratories of automotive manufacturers, the fact remains that it is not done and that if it were undertaken it would be only natural to consider the results in private property instead of giving the industry the benefit of the research. While the section cannot accept direct contributions manufacturers can supply equipment and pay the salaries of personnel.

Pan-American Highway Education Worth Fostering

IT is none too early for the industry to get whole-heartedly back of the Pan-American Road Congress which will be held in this country next May. Its potentialities are beyond estimate. Funds will be provided to pay the expense of three weeks' intensive study of highway construction and highway transport by forty delegates from Latin American countries. They will include leaders in the movement for better roads, economists and educators. Practical lessons will be taught by visits of inspection to such States as North Carolina, Kansas, and Nebraska where soil and climatic conditions are similar to those in the lands from which they come. When they return home a good-roads congress will be called in each of the countries represented, to be followed sometime in 1925 by the greatest conference of all at Buenos Aires. Development of good roads in Latin America will bring steadily expanding markets for American road building machinery and materials as well as motor vehicles while giving tremendous impetus to industrial and agricultural development in the countries doing the work.

Upham Has Done Big Job Developing North Carolina

SOME day the real story will be told of the marvelous industrial and agricultural development of North Carolina coincident with the construction of a real highway system. The people of the State owe a debt they never can pay to Charles M. Upham, the State highway engineer. When he took over the job about five years ago he had a vision and he has seen it materialize. He believed that instead of waiting for road service until they could be provided with hard surfaced highways, it would be possible to give the people in every corner of the commonwealth roads which could be made to give service the year round under the traffic they were called upon to bear. This he has done and at moderate cost because he has used road building materials ready at hand. When he

More or Less Pertinent Comment on Topics of Current Interest to Men in the Industry

took over the job motor vehicles were virtually useless, except in scattered sections, because of impassable roads. All this has been changed in half a decade and it is now possible to drive over a good road to almost every farm in the State.

Amazing Bus Growth Is Found in Louisiana

OBSERVERS who recently have visited Louisiana tell an amazing story of motor vehicle development in that State as a result of systematic highway construction. Regular bus and freight lines are operating on schedules in several sections of the State with fixed rates for freight as well as passenger transportation. Railroads are said to have lost most of their short haul l. c. l. business and are now used only for long hauls. Plans are under way for the establishment of Pullman motor bus service between New Orleans and Baton Rouge.

Safety Education Needed to Save Lives of Adults

ACCIDENT prevention education in New York City up to this time has been confined largely to children. That it has been successful is shown by the fact that only 381 children under sixteen lost their lives in vehicular accidents in the first ten months of 1923 as compared with 413 for the corresponding period last year. This record was made notwithstanding the fact that there were 20,000 more school children this year and 30,000 more automobiles. While fatalities among children decreased by 32 the total of casualties for all ages increased by 39. This suggests the necessity for more intensive accident prevention work henceforth, particularly among older persons. Jay walking leads all other accident causes and cost 281 lives in the first ten months of this year in New York. Notwithstanding the gruesome toll it is gratifying to note that the percentage of lives lost per 10,000 vehicles was 26.43 in 1922 while this year it has been only 24.92.

Storage Facilities Increase As Dealer Corps Expand

AUTOMOBILE manufacturing companies which have increased their dealer representation have automatically increased their winter storage facilities without expense to themselves. That is said to have been one of the primary reasons for Ford's decision to abandon the exclusive territory system. He now has more than 9000 dealers and they will absorb a great many thousands of cars to be ready for spring business. This will tend to equalize his production in the winter months. The same condition holds true to a lesser degree with other companies, especially those in the lower price brackets. Both distributors and dealers propose to use caution in stocking, but with sales running higher than ever before at this time of year and with the assurance of a substantial spring demand, it is certain that producers will be able to continue operations on a larger scale than has been possible hitherto in the last quarter. It should be remembered, however, that output will not be synonymous with sales for the next few months.

Advertising Managers Will Delve Into Merchandising

ADVERTISING managers of companies which are members of the N. A. C. C. will dig into practical merchandising problems for two days at Cleveland this week. The meeting promises to be the most successful they ever have held and the program assures practical results. Advertising, after all, is a merchandising problem. Bad as some automotive advertising undoubtedly has been in the past it undoubtedly has done much to create the universal demand in this country for the motor vehicle and the equipment which goes with it. When advertising creates demand it cannot be counted a failure. But the average automotive advertising manager of today has many things to do besides write copy and buy space. In fact, most of that work is being done by agencies. Usually he is the sales manager's right hand man and he must be thoroughly familiar with sales problems. For that very practical reason it is only natural that he should be getting a broader vision of merchandising questions.

Intensify Sales Effort In Most Promising Cities

IT is worthy of note that 31 cities or half those in which surveys were made, reported increases in employment for October to the United States Department of Labor. These cities where it might be profitable to intensify sales effort were: Dayton, Bayonne, Memphis, Toledo, St. Paul, San Francisco, Syracuse, Jersey City, Pittsburgh, Atlanta, Baltimore, Kansas City, Fall River, Cincinnati, New Orleans, Louisville, Richmond, New York, Chicago, Flint, Providence, Youngstown, Waterbury, Lowell, Birmingham, Lawrence, Mass.; Passaic, Sioux City, Johnstown, Pa.; Milwaukee and Worcester. None of those which reported decreased employment was located in the South except St. Louis. The department reports that there would have been an increase in employment generally for October rather than a decline had it not been for the temporary closing of many of the larger textile mills in New England together with some curtailment of operations in the railroad repair shops. J. D.

Marketing Methods Should Be Revised, Tire Dealers Say

Urge standardization of sizes, elimination of spring dating, and conference between retailers and manufacturers. Fifty cities are represented at convention.

By Norman G. Shidle

A STRONG desire to cooperate with manufacturers and a full appreciation of the progressive steps taken by tire builders during the last twelve months were keynotes of the fourth annual convention of the National Tire Dealers' Association held in New York City at the Hotel Pennsylvania, Nov. 13, 14 and 15.

The dealers went on record as favoring revision of a number of current merchandising practices in the industry and stated definitely their views on many practical questions now confronting the trade. They reiterated their stand against direct sale of tires from manufacturer to commercial accounts; against selling more than four tires per car to vehicle makers for original equipment; and against several other practices which have met with considerable opposition in the past. The various proposals were in the form of recommendations to the N. T. D. A. board of directors.

The most important pronouncements of the dealers, from the standpoint of the manufacturer, were:

Standardization of tire sizes is urged strongly.

Tires should be sold to tire dealers and to car manufacturers at the same price.

All spring and seasonal datings should be discontinued.

A conference between tire dealers and manufacturers is urged, such a meeting to be held every three months.

Other recommendations made by the retailers involved vital points in merchandising methods, including the following proposals:

Tires should be distributed only through dealers whose principal business is selling tires for a profit.

Manufacturers should not sell tires direct to car dealers, unless the car dealer is willing to carry a stock.

Every effort should be made to see that tires sold for original equipment stay on the car until it reaches the user.

Sale of tires direct to consumers from factory branches should be discontinued.

Approval of these various proposals was not unanimous in every case, but an overwhelming majority of the retailers present favored each of the recommendations before it was passed. Both on the floor of the convention and in informal discussions between sessions, numerous dealers backed their opinions with much sound reasoning and considerable illustration from practical experience.

MORE than fifty cities were represented at the convention of the National Tire Dealers' Association held in New York City last week. Two hundred delegates attended the sessions and most of them were active tire retailers. One dealer came all the way from Portland, Ore. Akron was decided upon as the site of the 1924 convention.

Tire manufacturers will be interested in this account of what the dealers are thinking about as brought out at their fourth annual gathering. The accompanying article attempts to summarize the ideas and opinions expressed by the dealers in informal conversation as well as on the convention floor.

The recommendation urging action in the standardization of tire sizes came at a particularly opportune moment, since strong pressure is being brought to bear from other sources in an effort to get something constructive accomplished in this important work. The retailers are interested in it because they are now forced to carry much heavier stocks than would be necessary were tires confined to fewer sizes. They feel that they are bearing a heavy burden which might readily be lightened if tire and vehicle manufacturers could only agree on some constructive plan of action.

The dealers are particularly concerned about standardization because the advent of the balloon tire, which most of them feel is assured of rapid success, is bringing in a new set of sizes which will further increase inventory loads.

THE demand that tires be sold to car manufacturers at the same price as to tire dealers is based on some fundamental economics which will bear serious consideration. The dealers feel that loss sustained on original equipment sales must be made up somewhere. Replacement tires are forced to bear more than their fair share of marketing cost, since they must be sold to dealers at a price large enough to cover losses or decreased profits already involved in sales to car factories.

To sell any product without reasonable profit is economically unsound, many of the dealers point out, and such a policy results in various merchandising evils which otherwise would be avoided. Chief of these is the

resale, by vehicle manufacturers, of tires sold to them for original equipment. These resales can be made at a price much lower than that for which the tire dealer can sell, because of the small original price paid by the car manufacturer.

The recommendation that all spring and seasonal dating be abolished was not passed without some sharp disagreement. Some retailers felt that dating terms were a matter to be decided between manufacturers and individual dealers and that it should not concern dealers as a whole. Others pointed out, however, that it does concern dealers as a whole very vitally because of the demoralized retail conditions which often result from it.

This latter group, which included apparently about 85 per cent of those present, said that spring datings might not be particularly evil inherently, but that so long as human nature is constituted as it is, the difficulties of overloading, followed by forced bargain sales and demoralization of retail markets, are likely to continue to result from such credit terms.

Tire Dealer Defined

Discussion from the floor indicated that the association did not mean just exactly what its recommendation says when it passed the resolution that tires should be sold only through tire dealers, "a tire dealer being a dealer whose principal business is selling tires for a profit." This definition would exclude a large number of the most important merchants in the association as well as in the tire business, many of whom do a very substantial tire business each year, but whose volume in automotive accessories and kindred lines exceeds that in tires.

The sense of the recommendation, so far as could be ascertained from the various opinions expressed, was that tires should be sold only through dealers a substantial part of whose business consists in selling tires for profit. The idea apparently was to urge the exclusion of car dealers who do not carry a stock or who are willing to give tires away in an effort to sell vehicles.

The three-day session was attended by two hundred persons, a large majority of whom were tire dealers. Representatives came from all over the United States, one delegate traveling from Portland, Ore. Analysis of the registration list shows that more than fifty cities were represented by active tire retailers, so that the association at this gathering definitely established itself as being truly national in scope.

The N. T. D. A. gave every evidence, throughout the convention, of being well on its way to success. A good deal of internal organization and extension work is still to be done apparently, but the enthusiasm shown by those who attended the New York gathering and the conservative administration of the organization's activities during the last twelve months indicate ultimate stability.

Organization Plans Developed

The earnestness of the members is well illustrated by the final event of the business session. A report of the ways and means committee had just been approved in which provision for an emergency fund of $3,000 was made by a bond issue of $2,000 and the sale of life memberships at $50 each.

Within fifteen minutes after this measure had been voted through, pledges of $3,150 had been received for bonds and life memberships from those dealers present at the meeting.

It was decided to hold the 1924 convention in Akron, Ohio.

Representatives of manufacturing companies were present and were invited to take part in the discussion freely, although few availed themselves of the offer.

The dealers evinced a deep interest in current merchandising trends and their comments were largely of a constructive character. In opening the meeting, President Burger urged that remarks on distribution subjects be confined to the present and the future; that the past be forgotten and that the entire group work together for making things better. His admonition was heeded.

Much of the time of the convention was taken up with discussions of internal organization and possibilities of further developing the association. A stricter and more thorough enforcement of Robert's rules of order and a more detailed knowledge of parliamentary procedure would have accelerated these parts of the meeting very materially and left more time for exchange of views on topics of more general concern.

George J. Burger of New York was re-elected unanimously to the presidency of the N. T. D. A. for 1924. Thos. F. Whitehead of Chicago was chosen vice-president. The Board of Directors for the following year, in addition to the president and vice-president, will be: E. P. Farley, Minneapolis; Clay D. Manville, Pittsburgh; Nathaniel W. Howell, Wilmington; H. A. Rhunke, Milwaukee, and P. J. Quigley, Memphis.

Richard Lennihan, Assistant Director, Harvard Bureau of Business Research, talked to the dealers on Wednesday afternoon about some of the fundamentals of retail selling and asked their cooperation in providing information for the research into retail tire selling which the bureau has undertaken at the request of the Rubber Association of America.

W. F. Schmidt of the New York Telephone Co. told how to get business by using the telephone and gave some very practical information for use in making telephone selling more efficient and more effective. W. Herman Gruel emphasized the need for collection and proper interpretation of sales statistics on the part of the Association and the dealers comprising its membership. R. W. Davis, Schrader & Son, described the functioning of the Schrader valve and gave some hints of value in servicing that unit.

Duncan Speaks at Dinner

W. W. Duncan, president, Hood Rubber Co., spoke at the banquet as representative of the Rubber Association of America. Duncan told of the constructive work done by the Rubber Association in abolishing the mileage guarantee and establishing the standard warranty in its place. He mentioned other methods which are being used to better merchandising conditions in the tire trade and bespoke cooperation of the dealers in these efforts. He outlined the survey which is being undertaken by the Harvard Bureau for Business Research and pointed out that its success depends largely upon the aid given by dealers in providing information sought.

Robert S. Binkerd, vice-chairman, Committee on Public Relation of the Eastern Railroads, also spoke.

Incorporation papers for the N. T. D. A. were drawn up and passed during the convention.

IN the Oct. 4 issue of AUTOMOTIVE INDUSTRIES the chart on page 668 giving the b.m.e.p.-speed curves of the Wright "T3" 12-cylinder engines as graphically shown were 10 lb. low. The b.m.e.p. per sq. in.-r.p.m. curves for both the high and low compression engines respectively should be read as follows: 139 at 1600, 138.5 at 1800, 137 at 2000, 134 at 2200, and 130 at 1600, 129 at 1800, 128 at 2000, 125 at 2200.

Progress in Bus and Rail Car Design Shown at Paris Exhibit

Four-wheel brakes have been installed on many models. Light trucks are prominent, but heavy types have been given little attention.

By W. F. Bradley

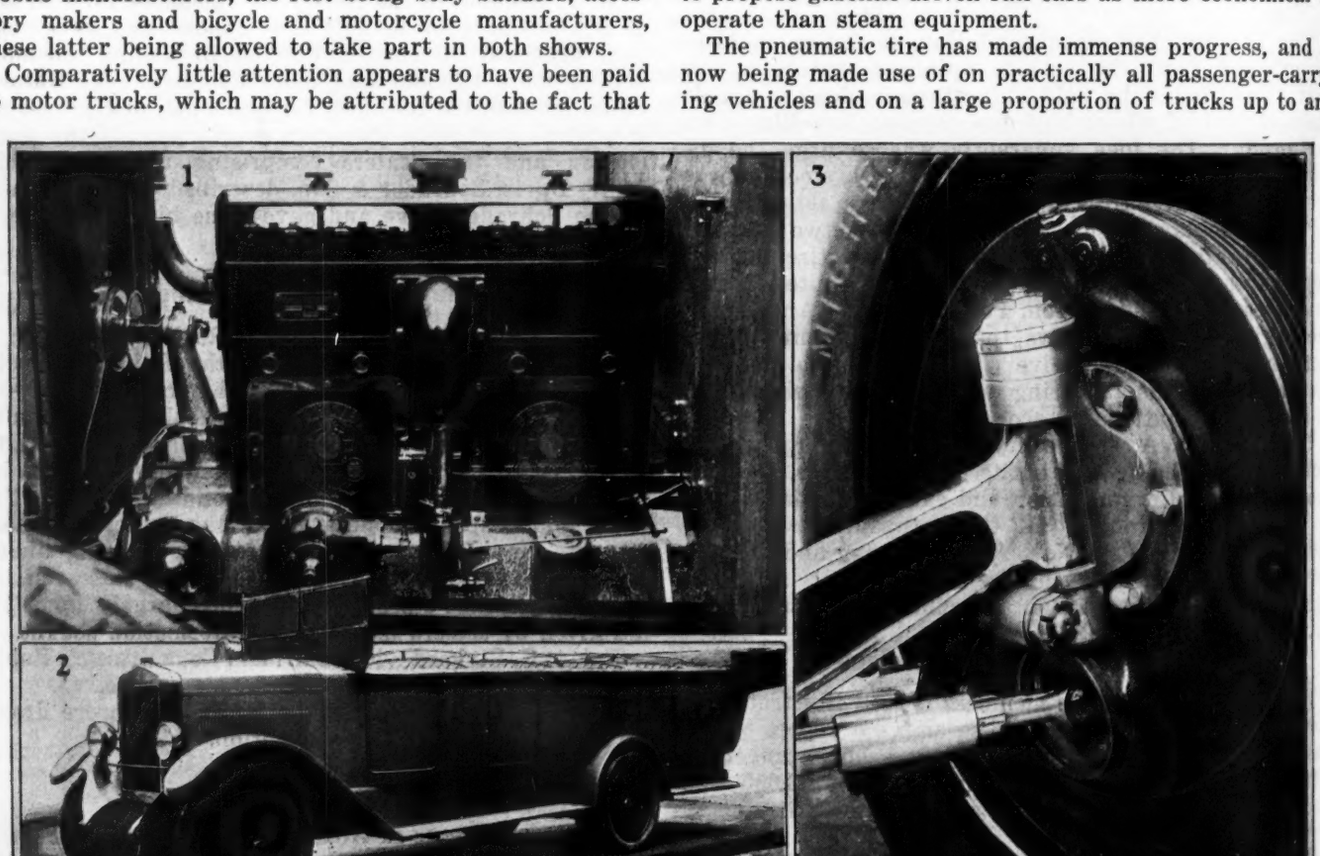
THE truck and industrial vehicle show opened in the Grand Palais Oct. 27, taking the place of the passenger show which closed ten days ago. This is the first time the French industry has organized independent shows for passenger cars and commercial vehicles, the practice in the past having been to group all kinds of vehicles in one show, even if that entailed the construction of special buildings. It is largely because the overflow buildings failed to give satisfaction to exhibitors that it was decided to have two distinct exhibitions in the Grand Palais this year.

The hall, which was too small for the passenger cars, is more than sufficient for the trucks, for although there are about 380 exhibitors altogether, only about forty are automobile manufacturers, the rest being body builders, accessory makers and bicycle and motorcycle manufacturers, these latter being allowed to take part in both shows.

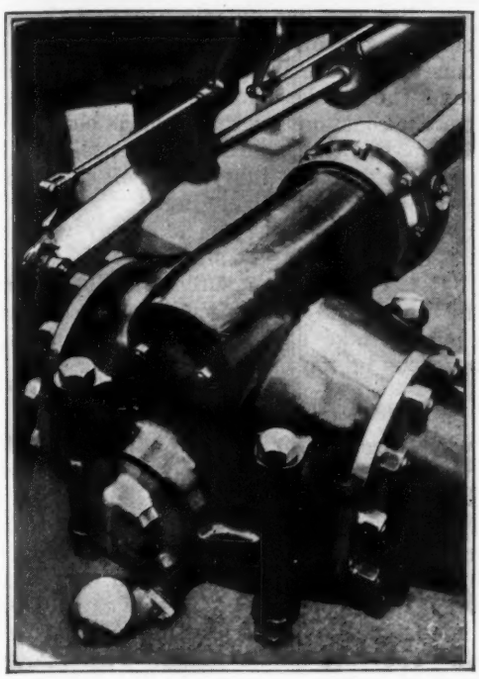
Comparatively little attention appears to have been paid to motor trucks, which may be attributed to the fact that the French market has not yet completely absorbed the immense military stocks left in the country at the end of the war. This does not apply to light trucks with a load capacity not exceeding 2000 lb. As these were little used in the war, there are no accumulated stocks, and the demand among farmers and small users for general utility vehicles being strong, the display is important.

The greatest amount of work has been done in big passenger-carrying automobiles, these comprising omnibuses, open sightseeing motor coaches and high-grade closed coaches used on regular lines as feeders to railroads or for private parties. Rail cars are also a prominent feature of the show, for French firms are taking advantage of the worn-out condition of narrow gage light steam locomotives to propose gasoline-driven rail cars as more economical to operate than steam equipment.

The pneumatic tire has made immense progress, and is now being made use of on practically all passenger-carrying vehicles and on a large proportion of trucks up to and



1—New Berliet overhead valve engine for 3-ton truck and omnibus. 2—Berliet sightseeing coach for Alpine service, with pneumatic tires and four-wheel brakes. 3—Front-wheel brake on Berliet truck and motorbus chassis



Delahaye double reduction rear axle (spur and bevel gears)

including 3 tons useful load. The practice is to use clincher bead steel disk wheels with single tires in front and duals in the rear; the biggest size tire employed is 1025 by 185 (practically 7¼ in. section), but the 955 by 155 mm. size (6 in. section) is more extensively used. Pneumatics have been adopted exclusively for fire engines, not a single one being seen in the show with solid rubber tired wheels.

For the first time front wheel brakes are found on an extensive scale on truck and omnibus chassis. For slow speed trucks, even when mounted on pneumatic tires, rear wheel and transmission brakes are considered sufficient. But for practically all makes of sightseeing automobiles, carrying 20 to 40 passengers, the brake equipment comprises front wheel, transmission and rear wheel brakes, frequently with a servo-mechanism. For light speed wagons and general service trucks up to about 2500 lb. useful load, it is not the practice to fit front wheel brakes, even though the makers of these chassis use a four-wheel braking system on their passenger cars. The display of taxicabs is not big, but those shown are all fitted with front wheel brakes. The chain-driven truck has lost ground before the double reduction, worm or internal gear type of rear axle. Comparatively few entirely new chassis are on exhibition. Some attention is now being paid to electric trucks, under the impulsion given by the Government to this class of vehicle, with the hope that gasoline imports will thereby be decreased. Producer gas trucks also find a space in the show, and a State-aided competition for this class of engine is now in progress. There are two attempts to make use of gas oil on normal internal combustion engines by the use of suitable vaporizers. Fiat shows one of these on a farm tractor, and the other is the Maxiwar, displayed by De Dion-Bouton.

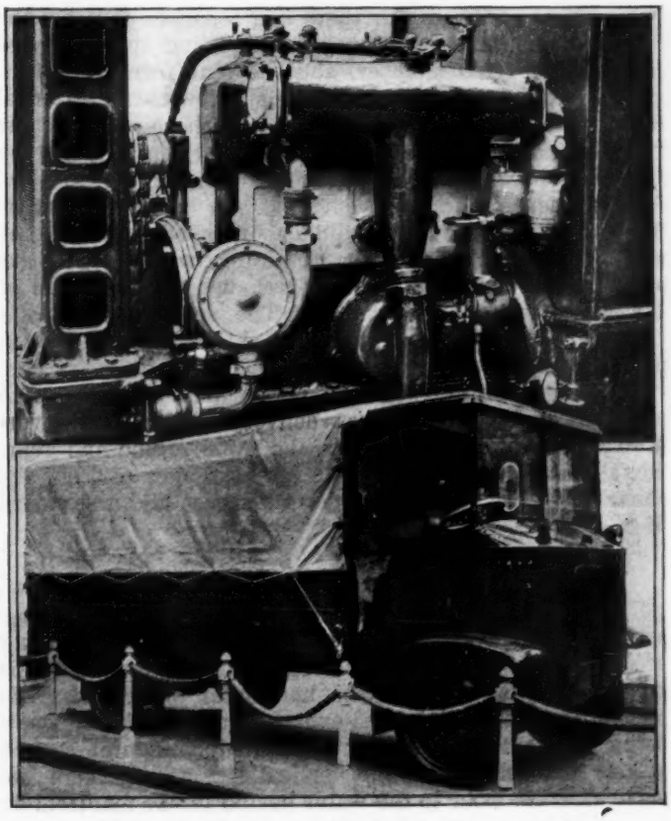
Berliet has an entirely new chassis of modern design specially built for motor coach service, its features comprising a four-cylinder overhead valve engine, a double reduction rear axle, a servo-applied brake on all four wheels, an entirely independent hand-controlled set of brakes on the rear wheels, pneumatic tires and an engine-driven tire pump.

While specially designed for public passenger service and for a 3-ton load, the Berliet follows the firm's latest passenger car practice, having block cast cylinders having a detachable head, vertical valves with inclosed pushrods, water pump and magneto driven off a cross shaft, high pressure lubrication, and three-point support of the engine on the frame. The gearbox is separate, and a cross shaft at its rear end carries the friction type servo-drum through which the four-wheel brakes are applied. Inclosed propeller shaft drive is used, with the forward end of the torque tube carried in a spherical housing on the rear of an X-shaped central cross member. The brakes are of the same general type as those used on Berliet passenger cars, with the brake camshafts mounted in the front axle and a spherical universal interposed between shaft and cam. This chassis, designed for receiving 20 to 25-passenger open sightseeing coaches, is mounted on 955 by 155 mm. pneumatic tires.

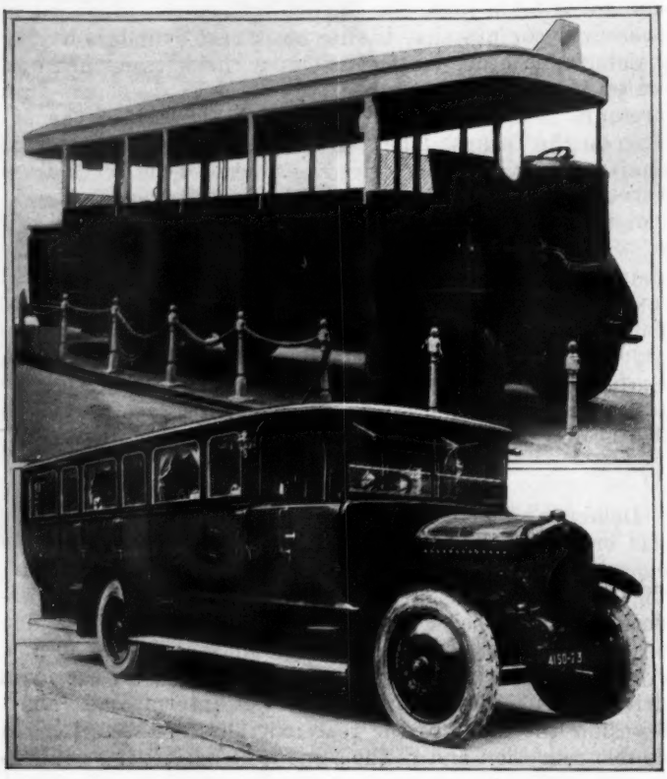
Side Chains Eliminated

Delahaye, one of the oldest of French truck builders, has broken away from side chains on a new 4-ton truck chassis shown with pneumatic tires. The rear axle, having the appearance of an overhead worm type, is a patented spur and bevel double reduction, with a spur pinion on the extremity of the propeller shaft, meshing with a crown wheel on a shaft under and parallel with the main drive shaft. Bevel pinions on the intermediate shaft transmit the drive to the rear axle shafts, thus giving a double reduction and at the same time permitting of arching the axle, which tends toward more economical tire wear on heavily cambered roads. Experience has shown that with big dual tires (solids or pneumatics) the inner tire carries most of the load if a straight axle is used.

Renault has modified his truck design by mounting the gearbox on the forward end of the torque tube, making the design in this respect uniform with that of his passenger



Above—Fiat tractor engine with exhaust jacketed intake manifold, allowing gas oil to be used. Below—New Fiat 2-ton worm drive truck with engine under driver's feet



Above—New type Paris high speed omnibus with pneumatic tires and front-wheel brakes, built by Renault. Below—Luxurious 26-passenger sedan on Saurer chassis with front-wheel brakes and 7-in. pneumatic tires

cars. The difference between the two types is that the torque tube is received on a central cross member, and between this and the engine there is a separate housing, the forward part, ahead of the gearbox, being spherical and carried in a cross member, and the rear forming a fork attached to the central cross member, with an external contracting brake inside the fork. With this design the gear-shift and brake levers are mounted centrally on top of the spherical housing in front of the gearbox.

Fiat has produced an entirely new 2-ton pneumatic tired truck with a four-cylinder overhead valve engine under the driver's feet, thus obtaining, with a wheelbase of 137 in. and very little rear overhang, a body length of 174 in., driver's cab excluded. The design is different from anything previously marketed by Fiat, and comprises pushrods for valve operation, unit powerplant construction and an overhead worm rear axle. Fiat has also produced a 1000-lb. express delivery wagon with overhead worm gear axle. This is the same engine and gearbox as used on the firm's 10-15 hp. passenger car, but the chassis is special, with a longer wheelbase and a standard 56-in. track.

Special Carbureter on Fiat Tractor

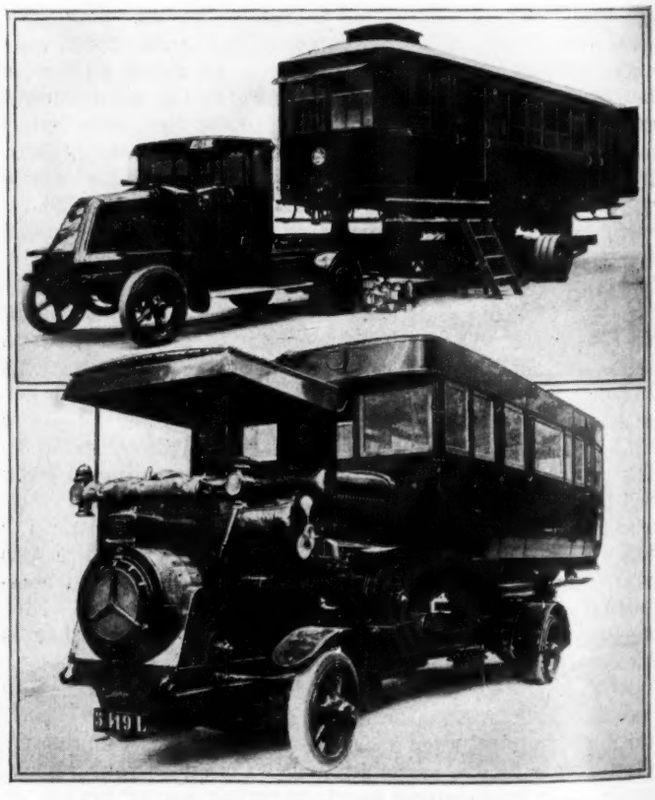
The latest type Fiat farm tractor has a special vaporizer and carbureter allowing the use of gas oil, with a saving of 60 per cent on fuel costs. The two-float carbureter is mounted at the rear of the horizontal branch of a T-section combined intake and exhaust manifold, the mixture being led through the exhaust heated horizontal branch of the manifold, down the vertical leg, and through the valve stem chamber to the water heated intake manifold on the right-hand side of the engine. Gasoline has to be used for starting, to secure the necessary temperature for vaporizing the heavy fuel, but under normal conditions it is possible after about three minutes' running to switch over to a gasoline and gas oil mixture, and three minutes later to run on gas oil only. To provide for differing weather conditions, the distance covered by the exhaust gases around the intake manifold can be varied. It is claimed that the consumption of gas oil is between 0.66 and 0.77 lb. per hp.-hr., that there is no deposit in the cylinders, and that tests of the lubricating oil show no dilution even after a long period of running.

While differing in details, the Maxiwar vaporizer used on De Dion-Bouton trucks is similar to that of the Fiat company. It is claimed that success is due in very large measure to the special type of cast iron used for the exhaust jacketed intake manifold, ordinary castings being either too porous or too hard.

Buses Use Front Wheel Brakes

Front wheel brakes for motor omnibuses and coaches are used on all Renault models except commercial trucks. Among the new models having this equipment is a 28-passenger omnibus for service in Paris, with engine under the driver's feet, radiator on one side, and pneumatic tires of 1025 by 185 mm. The Paris General Omnibus Co. has decided to put into operation a series of express omnibuses and has intrusted Renault with the construction of the first batch. They are single-deckers with rear entrance, similar to the larger buses already in operation, and except for their pneumatic tires do not differ externally from the older type. This move must be looked upon more or less as an experiment both in the use of pneumatic tires and four-wheel brakes for city omnibus service.

Saurer is now fitting all his 3-ton truck chassis with front wheel brakes when supplied with pneumatic tires for passenger service. The brakes on the four wheels are in addition to the engine brake and an independent set of hand-operated brakes in the rear wheel drums. De Dion-Bouton has applied the Perrot type front wheel brake to its omnibus chassis. Delahaye is using a modification of



Above—Renault rail car on Renault semi-trailer for road transportation. Below—DeDion Bouton railcar mounted on special truck for road transportation

the Perrot brake for both omnibus and fire chassis, and Panhard is using his own type of front wheel brake for fire engine chassis only. Other users of front wheel brakes for motor coaches are Rochet-Schneider and Cottin-Desgouttes.

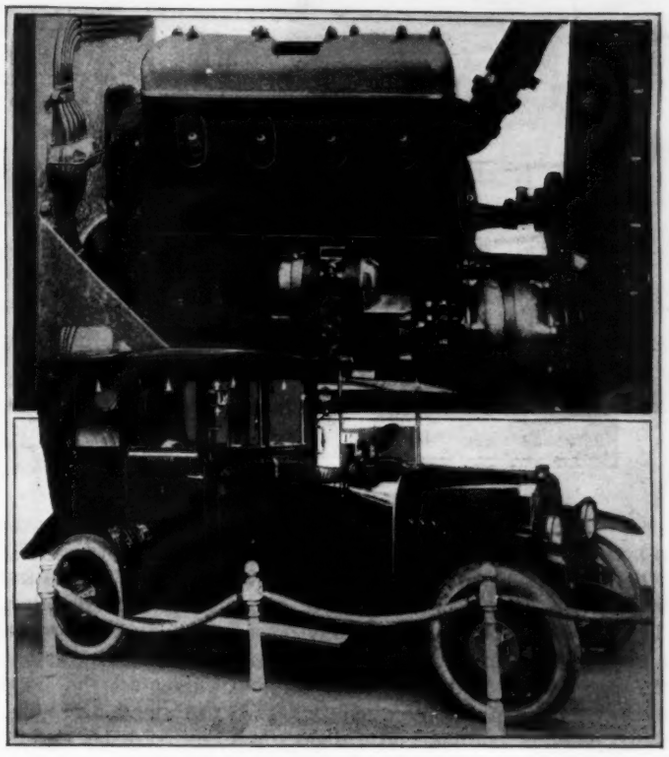
Berliet, Renault, De Dion-Bouton and Crochat are the French firms interesting themselves in the construction of rail cars; the last mentioned uses a gasoline-electric system, and the other gasoline engines only. Berliet has four distinct types, three of them being for depot work on tracks of 60 cm., 1 m. and 1 m. 44 and one for passenger service. In all cases the design provides for chain drive from the engine to either one or both axles.

Renault is producing four types of rail cars with two models of four cylinder engine, 3.9 by 6.3 in. and 5 by 6.3 in., each one of these having either single or two-axle drive. On all models a truck type engine is carried at one end, mounted on a subframe, and drives through a cone clutch, four speed gearbox and inclosed shaft to a bevel type rear axle. When drive is to both axles, the forward one of the two is operated by pinions from the main drive shaft and a short propeller shaft running forward. There are two crown wheels on the axle shafts, both being in engagement with the drive pinion, and either one or the other being locked according to whether the car is running ahead or reverse, thus giving four speeds in either direction. There is a driving post at each end.

De Dion-Bouton Design

De Dion-Bouton makes use of the same engine, clutch, gearbox, radiator and hood for the rail car as for their truck, and drive the rail car rear axle through double reduction gears. The engine is a four cylinder, 3.7 by 5.5 in., overhead valve type, with pushrods. It has four speeds, brakes on all wheels, and only an emergency reverse gear. The Crochat is an adaptation of the firm's gasoline-electric type truck to existing steam hauled light railroads.

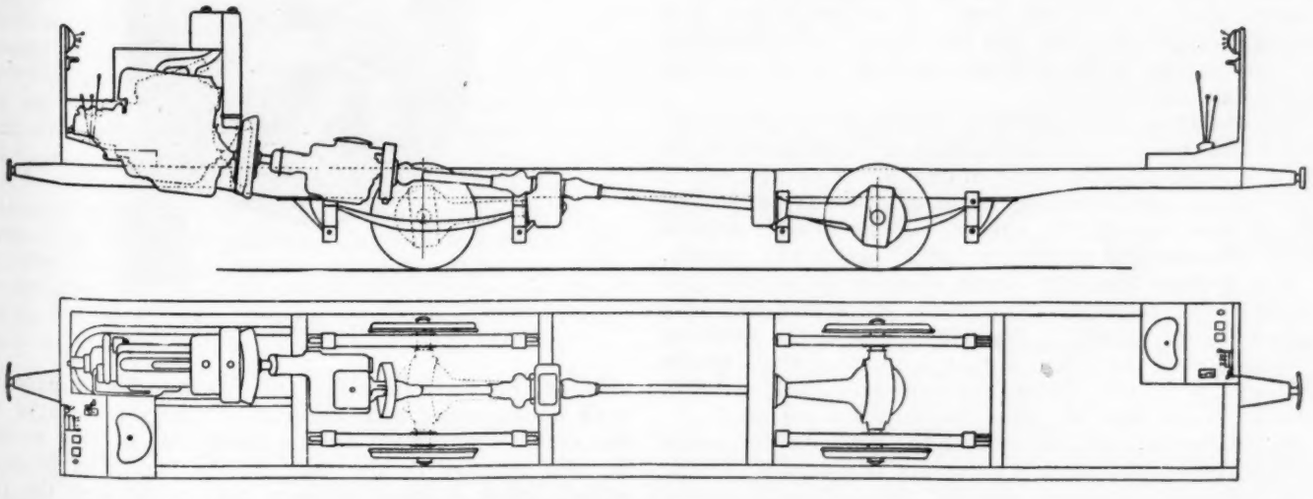
Both Renault and De Dion-Bouton have tackled the problem of road transportation of rail cars, this being necessary either when making deliveries or when the cars move from one set of tracks to another, either at the end of seasonal services or for repairs. Renault uses a modified type of his semi-trailer, the tractor being a short-wheelbase type with four cylinder engine, solid tires, live axle and final reduction by planetaries in the rear wheel hubs. The trailer is built up of two girder frames carried on a single axle with triple-tired steel wheels. The front end of the trailer is kept sufficiently off the ground to allow the tractor to be backed under it, the hitching being done automatically.



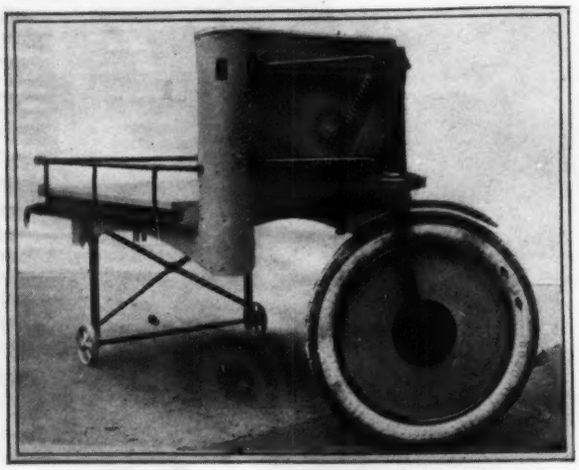
Above—Overhead valve engine of G. R. P. taxicab. Below—G. R. P. taxicab with front-wheel brakes

De Dion-Bouton make use of a long wheelbase truck, very low at the rear end, with a hand-operated winding drum just behind the driver's box by means of which the car can be hauled onto the rails on the chassis frame members. When in position, hoops are slipped around the extremities of the rail car axles and are locked in place. The De Dion-Bouton carried a couple of hundred yards of rail to allow of moving the car from the road to its track. Both the Renault and the De Dion-Bouton were hauled to the Paris show and put into position on their respective stands under their own power, although this involved climbing onto a stand raised one foot from the ground.

The only new specially designed taxicab chassis in the show was the G. R. P., built by one of the Paris operating concerns and representing latest Continental practice in this type of vehicle. This chassis has transmission and Perrot front-wheel brakes operated simultaneously through



Renault rail car with two-axle drive



Single-wheel trailer for hotel omnibuses

a pedal and an independent hand-controlled set on the rear wheel drums. All the brakes are of the internal expanding type, with the exception of the one on the transmission. The engine is distinctive in having a 2-in. diameter crankshaft carried in S. K. F. self-aligning ball bearings; the 2.7 by 4.3 in. cylinders have vertical valves in the head operated by pushrods and rockers. An open propeller shaft with a rubber and fabric universal at each end is made use of, but the weight of the shaft is carried in Ferodo-lined spherical bearings, so that the studs have to transmit the drive only. It is claimed that the average gasoline consumption under normal traffic conditions in Paris is at the rate of 25 m.p. U. S. gal. In Sunday service the consumption can be dropped to 28 m.p. gal. A Zenith carbureter with an original method of exhaust jacketing the intake manifold is made use of.

Distinctive types of omnibus and sightseeing bodies have been developed under the special conditions prevailing in France. In regions not directly reached by the railroad, motor bus services operate under Government subsidies, the type of vehicle used in nearly all cases being a single-decker closed car with entrance by the side of the driver and accommodation for a certain amount of freight, in addition to passengers. The sightseeing services are largely patronized by foreigners, who demand an unimpeded view but at the same time have to be given some protection against the weather. One of the most interesting of this type of sightseeing coach was a 28-passenger Delahaye operated by the P. L. M. railroad company in the Alps and having an all-weather body by Mom of Paris. An umbrella type canvas top, carried on demountable steel hoops hinged at their center, was used and was supplemented by glass windows in deep wood frames, completely closing the car on each side. Provision was made for carrying the windows, the hoops, and the roll of canvas for the top in a locker at the back of the car. To spread the canvas from the back to the wind screen supports occupied no more time than to put up a folding top and could be done by one man, while the entire car could be inclosed in from eight to ten minutes.

Bus Upholstery Luxurious

It is the practice in France to make use of motor coaches for such family gatherings as weddings, and this has caused the production of 20 to 28-passenger sedans in no way inferior in their trimmings and upholstery to the finest private cars on the road.

Hotel omnibuses occupy a big space in the body department. For this class of work Kapferer has a special baggage trailer consisting of a platform with a single tired wheel at the rear, carried in a bicycle type fork. The trailer is attached by two points to the rear of the omnibus and has a couple of struts and small diameter wheels, allowing it to be pushed around by hand.

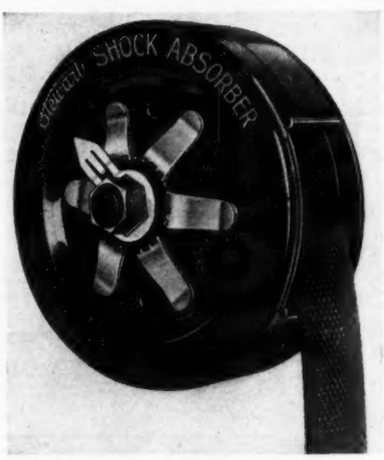
New Stewart Shock Absorber

A NEW shock absorber of the type comprising a cylindrical housing secured to the vehicle frame, from which a piece of webbing extends to the axle, has been brought out by the Stewart-Warner Speedometer Corp. There are only two moving parts in this device, a drum around which the webbing is wound, and a coiled rebound spring within this drum. A hardened steel stud passes through the drum, and the latter is provided with bearings at both sides, so it may turn freely and concentrically around the stud.

The energy of road shocks is absorbed by friction between two disks of self-lubricating friction material on the one hand and the ends of the drum on the other. This friction can be readily adjusted by means of a star-shaped steel spring, the spring, locking device, adjustment indicator and adjusting nut being on the outside.

It is obvious that this shock absorber is of the type which checks rebound only. When the frame and axle approach each other the resulting slack in the webbing is taken up by the coiled spring, and when they recede from each other the friction surfaces are caused to move relative to one another, thus checking the rebound.

As the central stud has to take the torsional force due to the checking action, it is necessary to mount it in such a manner that it cannot possibly turn. This is accomplished by riveting a heavy steel washer to the mounting side of the steel housing, this washer being punched with a hexagonal hole accurately fitting a hexagon on the stud. Projections on the outer side of this washer fit into grooves in the face of the mounting bracket, which latter clamps between this plate and the far frame side bar.



Stewart shock absorber

More Cars Will Have Four-Wheel Brakes at National Shows

Installations on front axles still among the most discussed topics in automotive circles. Next three months expected to tell real story of success or failure of this type of equipment on American cars. Hard operation one problem to be solved.

By J. Edward Schipper

FOUR-WHEEL brakes continue to be one of the most discussed topics about automobile plants. The writer during the past weeks has been visiting most of the factories in the passenger car field and conversation with the engineers turns unfailingly toward front-wheel brake applications. The landslide toward four-wheel brakes in Europe, with all but one of the cars at the French show and eleven makes in England using the installation as standard equipment, has made a marked impression. In addition, many English cars are equipped optionally at a slightly increased price.

There is a distinct feeling that the experiences of owners with these brakes during the next three months will tell the real story of the front-wheel brakes so far as American cars are concerned. This will be the first winter that large production cars so equipped have been out in the hands of many owners. Last year, Duesenberg was the only domestic car so equipped as standard, and the limited production of this company did not afford the opportunity to study the service problems which may or may not arise.

Better Brakes in Future

One engineer on whose car the brakes have been adopted recently stated that he did not by any means expect the installations to prove 100 per cent perfect the first year. He has no fear, however, that the dismal predictions of some of the more skeptical will be verified. The outstanding criticisms that have been offered, outside of the results of abuse in the hands of reckless drivers, have been hard steering, hard pedal action and difficulty of adjustment.

Reckless drivers we will always have with us. An engineer at one of the large plants compares the situation with the handling of airplanes. Straight flying, he says, has been shown to be as safe as any other method of transportation, while stunt flying is dangerous. So with four-wheel brakes, straight driving is just as safe as it is with two-wheel brakes, but the ability to do stunt driving has led to accidents.

Regarding the safety of front-wheel brakes, one of the facts that is commented upon by many engineers who have returned from the French show is that on the other side the danger of front-wheel brakes is never even mentioned, but, on the contrary, they are regarded as a safety measure. Opposed to this are manufacturers on this side who feel that there is a possibility of an increased number of accidents because drivers will take longer chances with this equipment on their cars.

Whether or not the criticism of hard steering is merited, engineers returning from Europe remark that, in a great many instances, the continental cars steer more easily than ours. Steering gears appear to be larger and there is less binding in the connections. Hard steering is accentuated, some say, because of the use of inclined kingpins, and if there is any difficulty in this respect with the normal installation it will be more marked with the inclined pivot. That American engineers have recognized the need for larger steering gears is borne out by the tendency on the part of many makers to increase the size of these units during the past two or three years.

Steering Problems Increased

If the balloon tire is to come in, the steering problem will become more acute, as the combination of the balloon tire and the four-wheel brake, it is believed, practically will necessitate a redesigning of the steering gear. A greater reduction is not to be desired except possibly at the extreme ends of the steering wheel movement.

One steering gear manufacturer who has worked in conjunction with the tire companies who are developing balloon tires is manufacturing a gear in which the reduction, due to a cam action, becomes greater at the extremities than at the center of motion of the steering wheel.

The problem of securing easy pedal action is a difficult one. There are some complaints concerning hard pedal action to be heard already. If the real benefits of the front-wheel brake are to be secured for the woman who drives, it is conceded that pedal operation must not be too difficult.

Five inches of pedal movement is considered the maximum of good practice. When the pressure available is divided among the linkages necessary to operate brakes on all four wheels the pressure at each brake is necessarily small, especially when four sets of brake retractor springs instead of two is considered.

Brakes with wrapping action, which provide to some extent and in an inexpensive way what is accomplished by the more elaborate servo mechanisms of Europe, are being employed to good advantage in some cases.

Internal Wrapping Type Design

One internal wrapping type of brake has been designed in which the leverage exerted by the pedal is utilized only to provide the initial contact with the drum. The drag of the drum on the shoe then tends to rotate the shoe, having the effect of greatly increasing the contact pressure and consequently the braking effect.

We get an entirely different viewpoint of the four-wheel brake in the industry than is secured by the public. Several manufacturers have commented on this as a result of investigations made through dealers. One

manufacturer, who has not adopted the front-wheel brakes, sent out a man who visited 600 small dealers. He asked those who handled cars both equipped and not equipped with brakes on all four wheels whether they had made or lost any actual sales because the cars were or were not equipped with front-wheel brakes. According to this investigator the number of sales that actually had not been closed or lost because of front-wheel brakes was almost infinitesimal.

On the other hand, it is certain that cars equipped with four-wheel brakes have brought the curious into the salesrooms, and a certain percentage of the curious are good live prospects. Makers who have adopted four-wheel brakes are unanimous in saying that the adoption has had a direct result on their sales.

From the present outlook there will be at least five more front-wheel brake installations at the New York show. Most of these will be optional equipment.

New Installation Probable

The recently designed Lockheed external hydraulic system announced on one make of car as optional equipment at $75 list, will likely be duplicated on two and possibly more models by show time, and other concerns are now completing experiments on brakes similar to the Rickenbacker and the Perrot types. Perrot has entered into an agreement for the manufacture of his brakes in this country and arrangements for a factory, probably to be located at South Bend, Ind., are being consummated by Vincent Bendix, who has the American rights.

Everything appears to indicate that brakes to be announced in the near future will be similar to those which have already been shown. An arrangement which has been suggested and which is receiving the attention of some experimental departments is the separation of the front- and rear-wheel brakes by interconnecting the front-wheel brakes with the clutch, leaving the rear brakes to be operated by pedal in conventional fashion. This has the effect of keeping the linkage on the brake pedal simple and the reductions normal.

Danger of Locking Eliminated

In operation, this linkage is claimed to work out well. The operator, when making an emergency stop, automatically presses down with both feet. This releases the clutch and applies both sets of brakes. In retarding the car normally only the rear brake is used, unless a quick rate of retardation is necessary. The front brakes are not as effective as the rear, because the operator, to apply them, has not only the brake springs but the clutch springs to overcome, so that the danger of locking the front brakes before the rear ones lock is slight.

Another layout which is old but which is still being investigated is the interconnection of the front-wheel brakes with the propeller shaft brake. This, of course, gives the advantage of the reduction in the rear axle and helps to put the major breaking duty on the rear wheels, where it is generally conceded to belong. On the other hand, the problems of heat dissipation and chatter often encountered in service installations on the propeller shaft, have to be met.

New Cylinder Grinder Has Arbor of Vertical Wheel Type

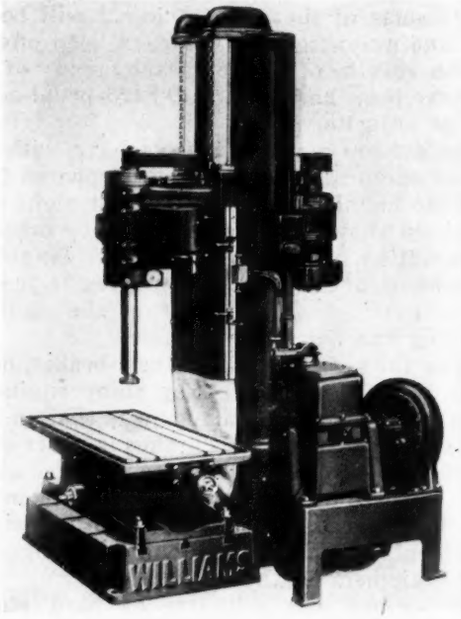
MOST cylinder grinders are arranged with the wheel spindle horizontal, which may be due to the general inclination to follow precedent and established practice, for all the earlier lathes and boring machines were of the horizontal type. A cylinder grinder with vertical wheel arbor has been brought out by the Hy-Way Service Co. and a number of meritorious features are claimed for it by the manufacturers. The grinder is recommended for both manufacturing plants and service stations.

It is claimed for this machine that the work can be handled easily and rapidly; that all grit and loose particles of metal are immediately removed from the path of the wheel; that, owing to the balanced construction of the head, a perfect alignment is maintained, and that, as there is no weight on the ways there is no wear on them. The grinder has electric drive and forms a unit construction with the electric motor. Cylinders to be ground are mounted on a universal table, which can be cranked in and out as well as crossways for centering the work. Both wet and dry grinding can be done on this machine.

The arbor is made up of two eccentrics, one within the other, giving the grinding spindle a planetary adjustment for feeding the wheel to the work. The grinding spindle is carried on double row ball bearings and runs at a constant speed of 7000 r.p.m. The unit head and powerplant travels up and down between heavy columns on Vees and is counterbalanced by weights in the two columns.

Change of feed is obtained by means of an Oilgear. The Oilgear variable hydraulic feed pump is mounted at the side of the column and driven by the motor. Oil is circulated under pressure to a hydraulic ram mounted in the center of the twin column, directly beneath and in the center of the head.

The same concern manufactures a vertical internal grinder with revolving table which has features similar to the cylinder grinder.



Hy-Way cylinder grinder

Four-Wheel Brake Adoptions Generate Sharp Discussion in England

Perrot type, with modifications, is design which is being used most widely by British makers. Show develops other technical trends.

By M. W. Bourdon

DESPITE the fact that twenty British makers now have adopted front wheel brakes, either as standard equipment or as an extra, on one or all models, there probably never has been any development in automobile design concerning which more diverse opinions have been held and strenuously maintained. These twenty makers turn out 44 different chassis models, but front brakes are offered on 27 models only; in some cases they are fitted to the maker's new model or models but not to the older and still current types, while in other cases they are fitted only to the larger or more expensive models of a line.

As regards designs of front brake, the most widely used is the Perrot type, with various modifications in detail. Especially is the Perrot-Farman type favored, in which the shoes are of different length and the anchorage is at the end of the longer shoe, adjacent to the camshaft, the cam operating directly on the smaller shoe only. This is termed the automatic servo pattern, for the friction between the smaller shoe and the rotating drum adds to the pedal pressure in applying the larger shoe to the drum. This scheme, it is held, removes the need for increasing the pedal leverage for four-wheel brakes and for the close adjustment between shoes and drum which increased leverage necessitates because of the practical limitations of pedal movement.

Rubery System Used

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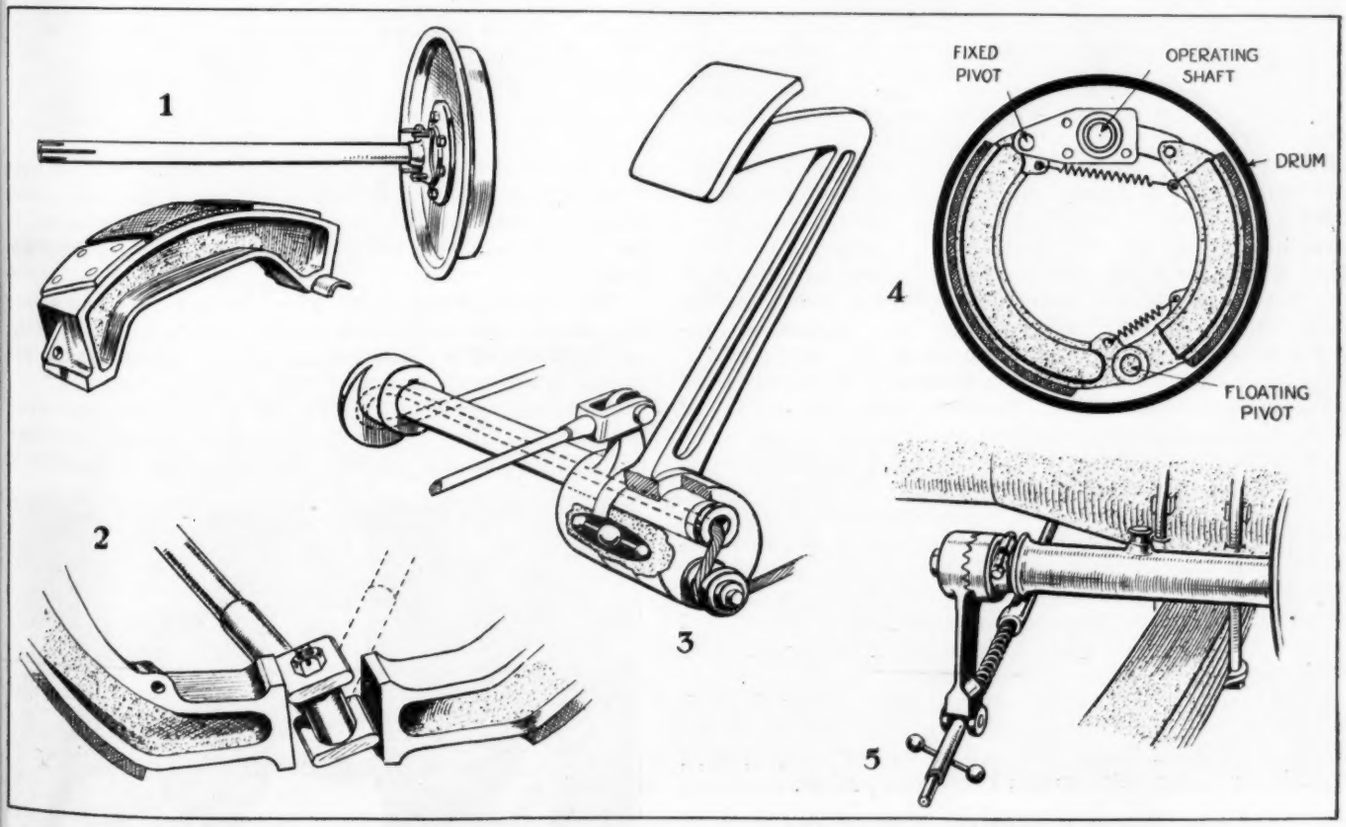

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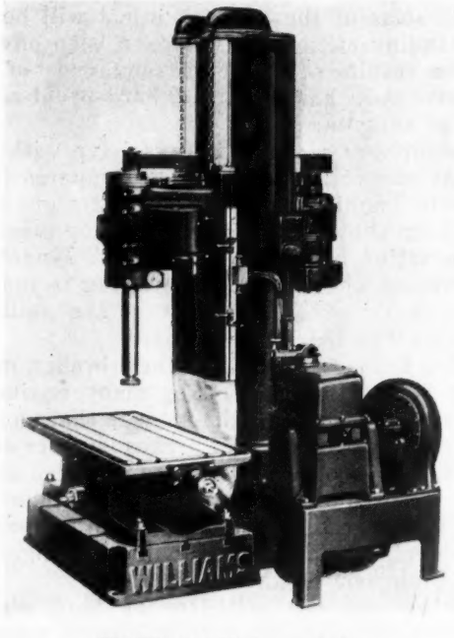

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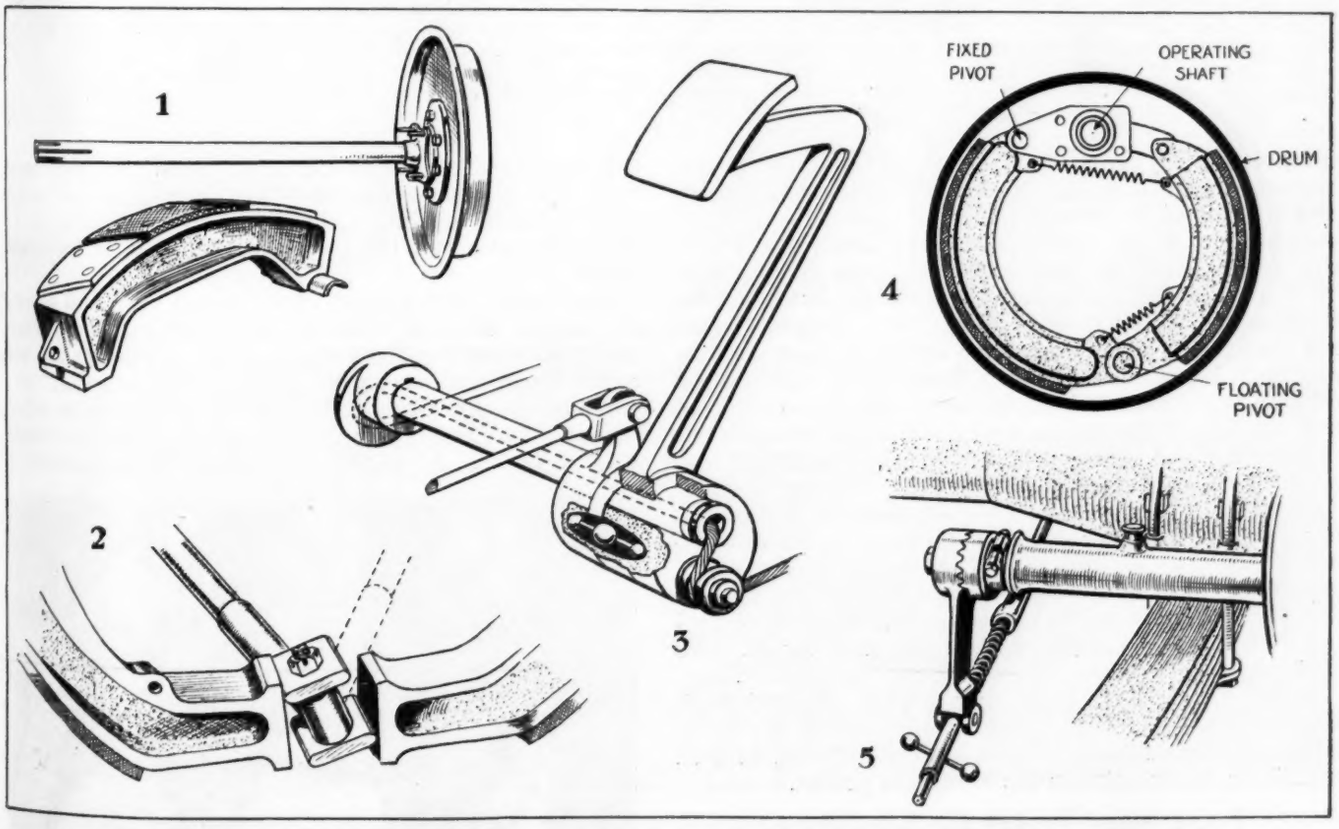

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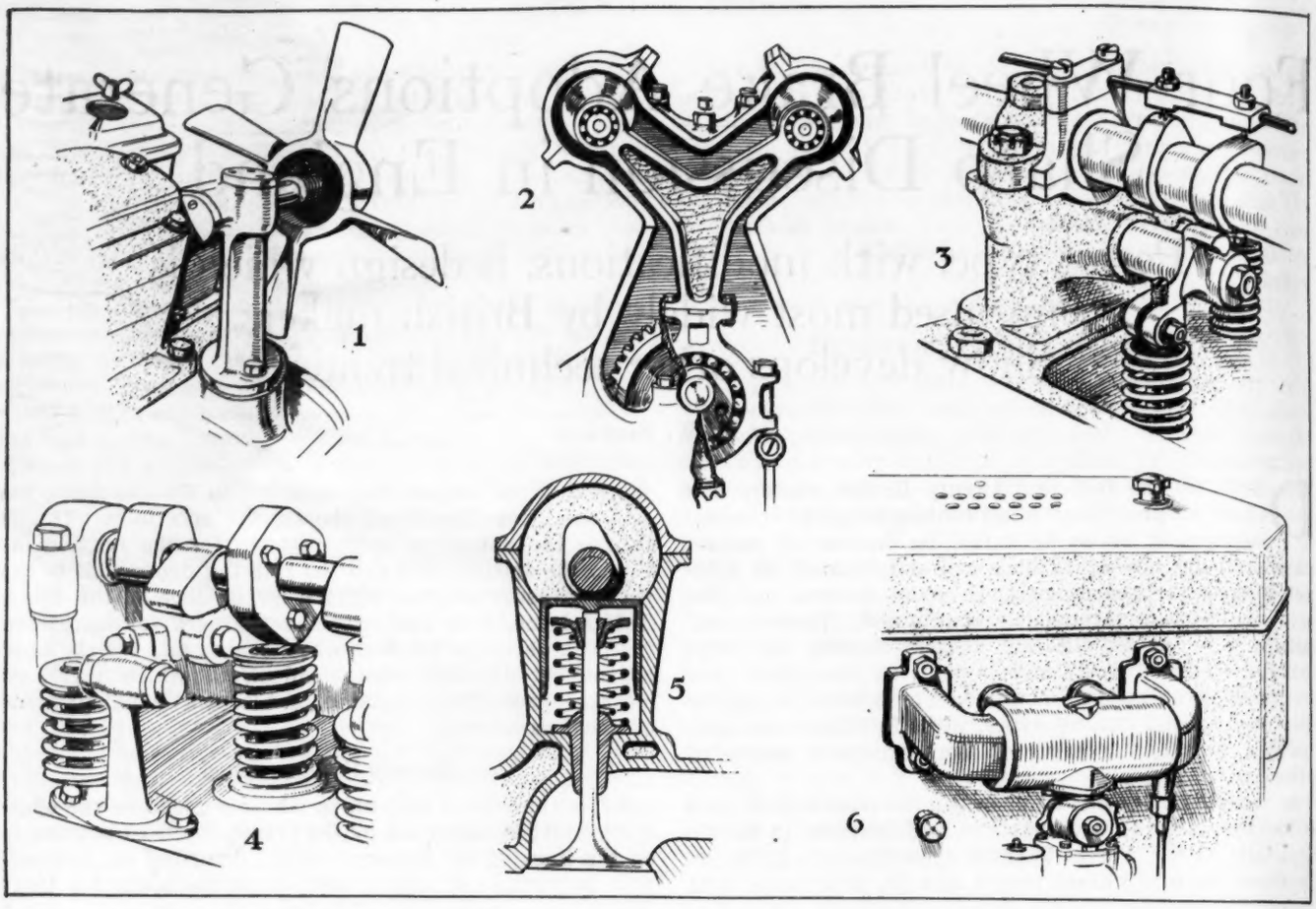


1—Positive drive for fan on new Rover Six. Fan shaft coupled to fan hub by friction disk. 2—Eccentric drive for two overhead camshafts on new Maudslay Six. Roller bearings on eccentrics. 3—Overhead camshaft of Wolseley 15 now has adjustable oil drip for each cam. 4—Multiple cam applying to spring plunger on camshaft of new Lanchester, to prevent "snatching" in camshaft drive. 5—Piston type cam follower and dual springs of new overhead camshaft Maudslay. 6—Exhaust jacketed intake manifold of Armstrong-Siddeley. Inlets to jacket about ports open to exhaust passage in cylinder block

is carried wholly by the axle and the half-elliptic springs are called upon to resist the tension of the pull-rods or cables. The new Lanchester carries a tube with a balance gear in front of the radiator, to which is attached the lever that is coupled to the pull-rod, while levers at both ends of this balancing shaft are connected to levers on the operating shafts by short coupling rods. Instead of having a universal joint between the operating shaft and the camshaft, Lanchester employs a form of cam which is not affected by the deflection of the shoes. The cam consists of two flat steel plates free to pivot about a bolt which forms in effect a T end for the operating shaft. In this case the latter is below the axle, whereas in the new Daimler (which has a front brake of similar design) it is above, supported at the inner end by a standard or bracket projecting up some 6 in. from the center, with a universal joint between it and the cam. No equalizer is used by the Daimler, the torsion of the cross-rods being deemed sufficient; a single adjustment is provided for all four brakes.

In the Vauxhall the operating rod runs axially through the swivel pin and lifts a cam-piece to expand the shoes. Flexible sheathed cables (Bowden wire) are used, with an equalizing device between the two front brakes.

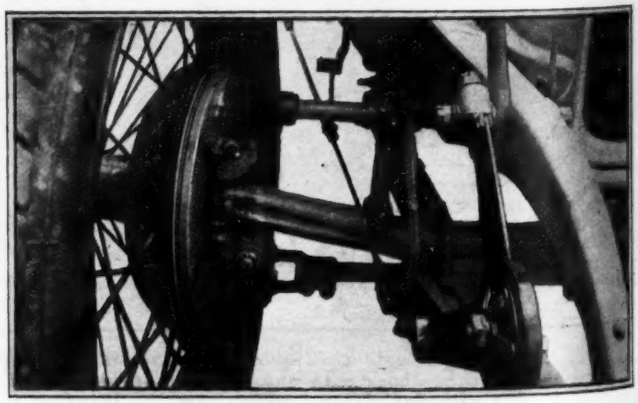
Front Wheel Brakes for Rolls-Royce

An eleventh-hour decision prior to opening of Olympia led Rolls-Royce to announce an intention to fit front brakes on the 40-50 hp. model next year.

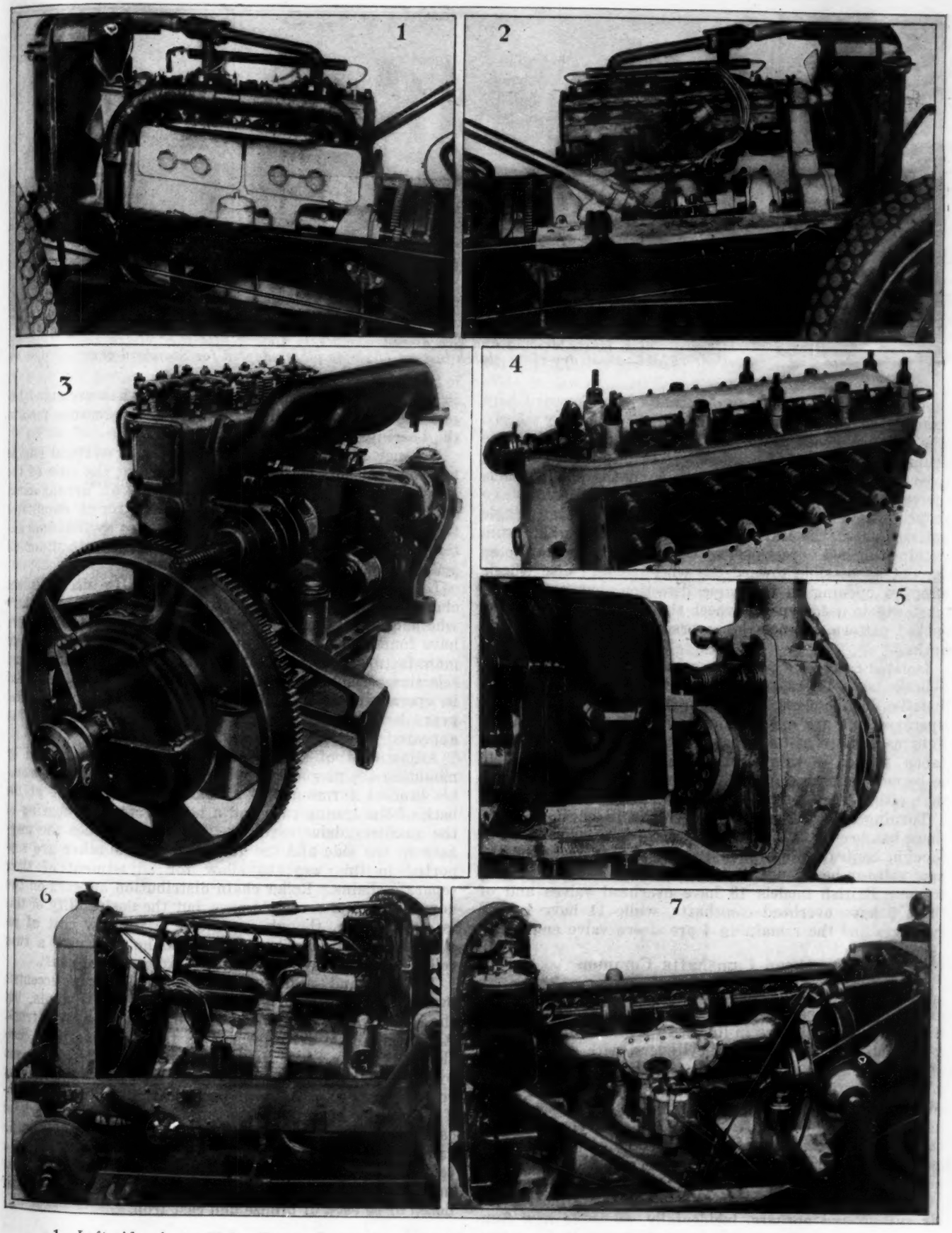
At present there is no standard four-wheel brake practice, unless it be in the operation by pedal. In many cases there is only one set of rear wheel shoes, actuated either alone by hand or in conjunction with the front set by pedal; but as a rule there are separate sets for hand and pedal.

The "boom" which front wheel brakes have had of late has reacted favorably upon brakes in general; more leverage is provided for pedal-actuated rear wheel brakes, and larger drums and shoes are fitted in some instances.

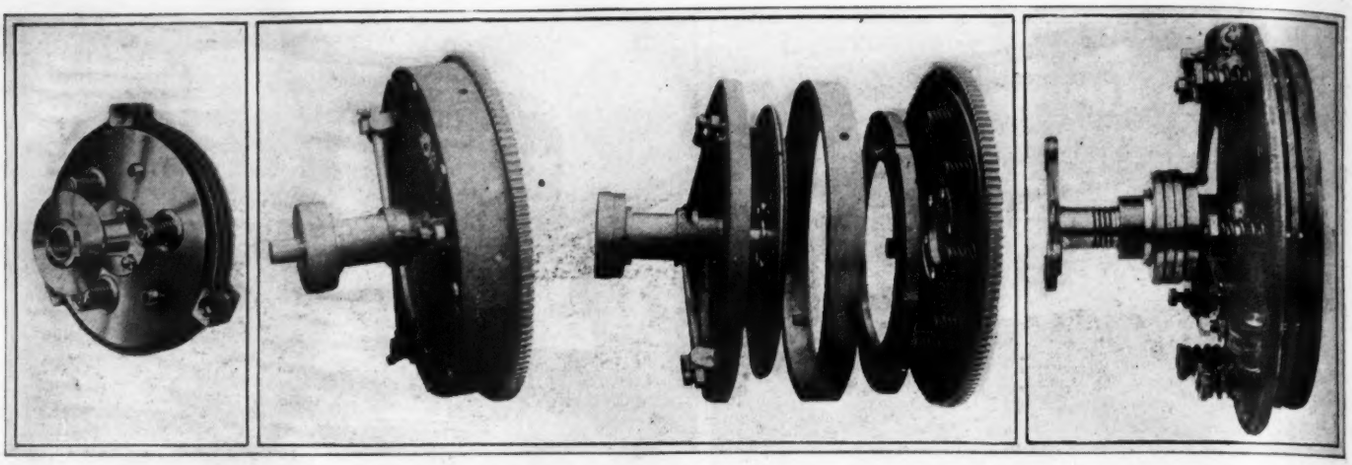
While the majority of British cars now have wheel brakes only, there is a slight reversion toward the transmission brake. In addition to the usual arguments in



Front wheel brake on new 35-hp. Daimler chassis. The greater part of the brake mechanism lies within the plane of the wheel



1—Left side of new 21-hp. Rover six engine. Note bracket stop on frame behind spring to prevent serious axle displacement if spring should break. 2—Right side of engine of new 21-hp. six-cylinder Rover. Note two detachable cylinder heads for block cast cylinders. 3—Rear end view of engine of new Armstrong-Siddeley Fourteen, showing casing of single-plate clutch at center of vaned flywheel. 4—Valve gear of 16-valve Bentley engine. 5—Example of magneto bracket serving as means of adjusting timing chain. Sprocket shaft bearing housed by extension of bracket. 6—Left side of new 35-hp. Daimler Knight six-cylinder engine. 7—Right side of new 35-hp. Daimler engine (3.82 x 5.12 in.)



Left—Bean dual plate dry clutch (three driving and two driven members). Center—Daimler clutch complete and dismantled. Right—Dual dry-plate clutch instead of single plate adopted for Standard cars

favor of the latter there is one that is put forward here against the concentration of all brakes on the rear wheels. The pairs of shoes are usually side by side and the wide drum needed for side by side shoes results in there being a lot of overhang of the wheels from the spring pads, increasing the bending moment on the axle casing. To reduce this moment to the minimum with even single pairs of shoes, the Daimler company sets the brake drum within a dished wire wheel so that the springs can lie as far out as possible toward the wheel center; disc wheels offer an opening in the same direction, but not so the most widely used type of wheel, the pressed steel, hollow-spoked pattern. Hence the reversion to the transmission brake.

Isolated cases of a return to metallic—usually cast iron —brake shoe liners are to be noted, and to enable the metallic dust to clear itself from the friction surfaces the liner sections are cut diagonally at the ends. In A. C. light cars there are alternate segments of cast iron and fabric shaped in this way, a combination which is held to be more effective, smoother in action and more durable than either kind of friction material alone.

Turning now to some of the trends in engine design, there has been a still further increase in overhead valves, though, contrary to French trends, a good many of the new valve-in-head engines have overhead camshafts. Of 33 new British models 18 have overhead valves and of these 5 have overhead camshafts, while 11 have L-head cylinders and the remaining 4 are sleeve valve engines.

Overhead Camshafts Common

The new overhead camshaft engines are not all high-grade productions, nor even engines of moderate size. One has eight cylinders in line with a piston displacement of 242 cu. in.; three have six cylinders, with displacement of 112, 120 and 175 cu. in., respectively, while the fifth is a light four (75 cu. in.). The latter is a slightly enlarged edition of an existing make (the Rhode), which has always had an overhead camshaft. It will be seen, therefore, that this form of valve operation is not applied only to large and expensive models, and it may be mentioned that no maker who had previously used it has dropped it in favor of push-rods. Nevertheless, the latter is the most popular system and appears, incidentally, on three new Sunbeams and on the new Armstrong-Siddeley Four, a low-priced production job.

As regards quietude in overhead valve operation, an important factor is undoubtedly lubrication, and in some of these engines pressure lubrication has been applied in place of either oil-mist from the crankcase or hand-feed to the push-rods and rockers. Wolseley has arranged adjustable drips over every cam, as well as pressure feed to the bearings of camshaft and rockers.

The new Beverley-Barnes eight-cylinder vertical engine has the camshaft located in an oil bath at the side of the head, the rockers being over the cams, an arrangement which appears worthy of consideration, for it eliminates the need for individual drips and provides copious lubrication without risk of flooding the head and resultant oil leakage down the valve stems.

Last year there was noted a tendency to discard silent chains in favor of helical gears, but many of the makers who had been experimenting with or adopted helical gears have found that these are not such a simple proposition to manufacture as they had imagined. They have found selective assembly necessary, if the gears are to be silent in operation, and to this procedure they object. Helical gears have certainly increased, but not at the rate that appeared likely at this time last year.

Adjustment of silent chains is generally arranged by mounting the magneto or other driven member on a movable bracket forming also a combined cover plate at the back of the timing case and a housing for the bearing of the auxiliary drive sprocket. On some engines the magneto on one side and the generator on the other are supported in this way, to allow for adjustment of their separate chains. Roller chain distribution appears on two new models and seven old ones, but the desirability of this is questionable, though one merit is the low cost of renewals. Lanchester on his new 20 hp. Six uses a twin roller chain to drive the magneto from a cross-shaft.

The Leyland eight-cylinder vertical triple eccentric overhead camshaft drive was absent from Olympia, but the same system of drive is used on a new Leyland truck. A new eccentric drive is used on the twin overhead camshaft Maudslay Six. Here the two camshafts are driven by one Y-shaped connecting rod, the eccentrics having roller bearings. A new light car, the Marlborough-Thomas, also has a double eccentric drive for its overhead camshaft, the eccentrics being set at 90 deg. Non-metallic camshaft gears appear on only six British cars out of a total of approximately 150, and not one of these is a new model; the vast majority of gears are of steel, with a half dozen or so each of bronze and cast iron.

Six-cylinder Light Cars

Approximately 30 per cent of new models have six cylinders, these varying in piston displacement from 100 to 350 cu. in., while more than half of them are of less than 125 cu. in. The six-cylinder light car is, in fact, one

of the features of the Olympia Show, though it is safe to say that the existing and potential demand for this type is decidedly small, and it can certainly be assumed that Morris—who has the biggest output of any British maker and who specializes in light cars—would not have held up production of the small Six he introduced last year if there had been much demand for that model.

That the British purchaser of 100-120 cu. in. cars prefers the four is confirmed by the greatly increased number of four-cylinder models within this displacement range. These are usually termed 14 hp. and are coming to be known as the "family" car; they form the biggest class of British passenger cars at the present moment and have very largely superseded the true light car with its smaller four-passenger body and an engine of 70-85 cu. in. The great reductions in the prices of fuel and tires since 1920, as well as in the prices of cars themselves, have made it possible for people who could afford only the smallest of cars three years ago to now bear the first cost and upkeep of something bigger. The light car itself retains its popularity because a new class of buyer is attracted to it for a similar reason.

Humber and Austin Successful

Two of the most successful cars of the year have been the 8 hp. Humber, which has a four-cylinder 61 cu. in. engine, and the still smaller 7 hp. Austin (45 cu. in.); increased production of both of these has been planned for next year and, although the prices have been reduced, the cars still list at £250 and £165, respectively, the Austin being no larger in overall dimensions than a big motorcycle and side car.

It is difficult to define the position of battery ignition, which seems to be "both coming and going." Just as last year, it has been discarded by some of the makers who had adopted it and taken up by a few others for the first time. Of 33 new models 22 have magneto ignition, though with two of these a battery system is optional. One of the latter is the new 14 hp. Bean, a car that is likely to be produced in considerable number, and it will be of interest to note next year whether the option is maintained or whether the standardizing of one system or the other then indicates a decided preference on the part of buyers; it will be the first real opportunity of the kind.

The hollow crankshaft system of engine lubrication has increased appreciably since last year and now is used on 54 per cent of cars of all sizes; next in favor is splash and pressure to the main bearings, the purely splash system having fallen off very considerably. This tendency toward pressure lubrication is accompanied by a trend to raise the oil filter in the circulation system to a more accessible position.

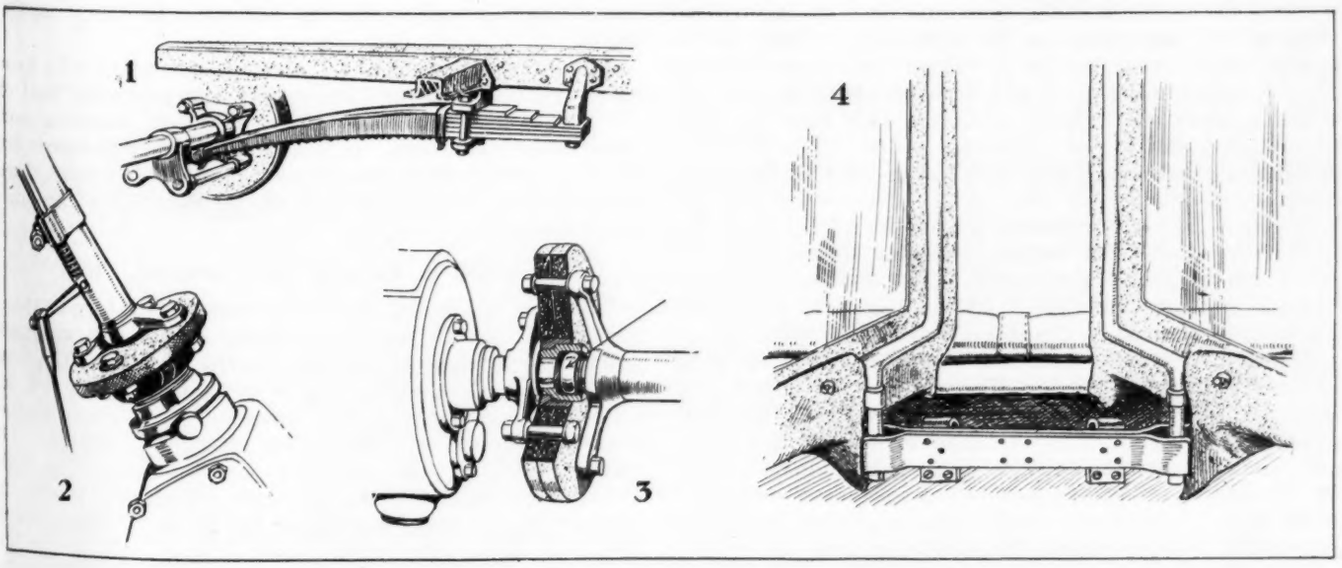
Filter Location

In nearly 70 per cent of new models the filter is well above the oil level in the sump, located where it can be removed, cleaned and replaced in a minute without losing a drop of oil and, of course, without draining the sump. Obviously it is a wise precaution, where the hollow crankshaft system is used, to make the filter easily cleanable, for the filter gauze must be of fine mesh to prevent possible causes of obstruction passing to the oil-ways and a fine gauze requires a more frequent cleaning than the coarser mesh which suffices for splash and even splash-and-pressure system. Complaints regarding burnt-out bearings, due to users indefinitely postponing the draining of the sump to clean a "bit of gauze," have therefore been met by putting the filter whence it can be removed for cleaning as easily as a spark plug.

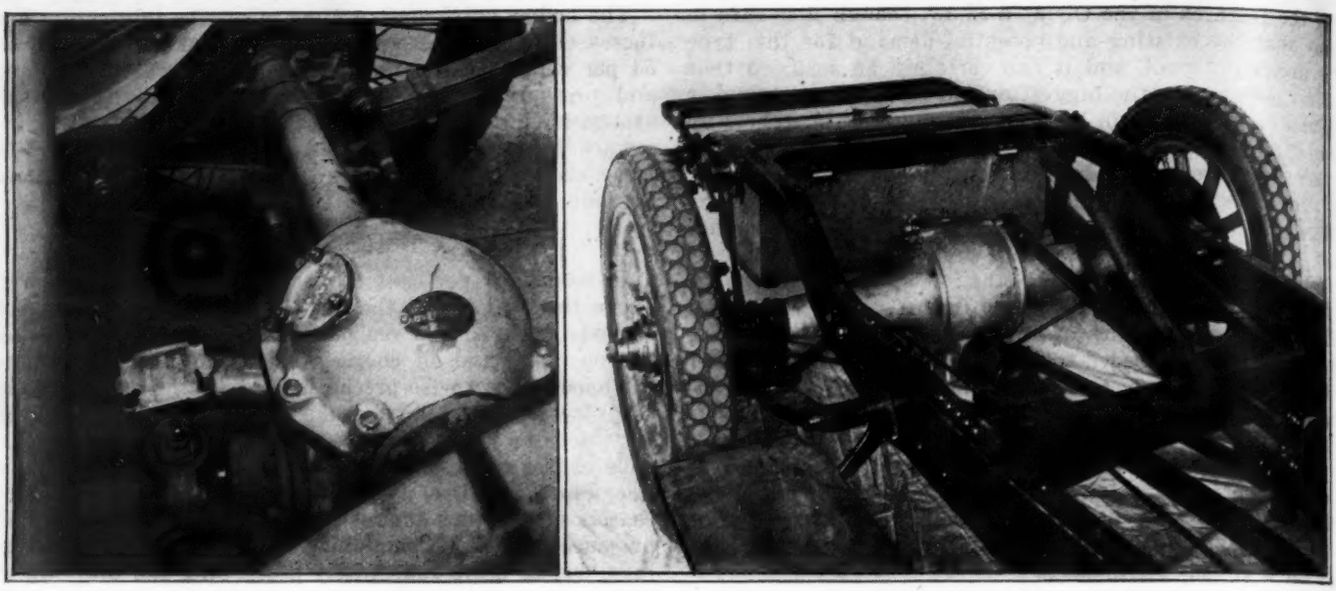
Aluminum pistons show a slight further increase, but steel connecting rods are still used in all except three engines, though it is known that many makers are experimenting with duralumin, the alloy which is used in the three engines referred to. In one of the latter, a 14 hp., duralumin has been used for over twelve months and no cases of failure attributable to the nature of the material have come to public notice.

Water cooling systems are approximately 50 per cent thermo-siphon. Oil cooling has disappeared, and there have been no developments in air cooling. Only 13 out of approximately 150 British cars have any means of controlling the water temperature, which does not represent a gain over last year. With one exception a thermostatic valve in the water riser effects the control, the exception having shutters operated by a thermostat.

Detachable cylinder heads are general, and in this connection two trends are observable, with a view to simplifying the refitting of heads without risk of subsequent



1—Rear springs of Armstrong Siddeley "Four-fourteen." Main bracket not pivoted but leaves allowed slight relative movement in clip. 2—Fabric disk joint at lower end of steering column on new 14-hp. Bean. Austin has adopted same scheme with a steel flange joint to simplify production of worm and assembly. 3—Calthorpe fabric disk joint with centralizing bearing. 4—Rear side curtains of Standard car swung inward and held by bracket at back of front seat to form rear screen with side aprons



Rear axle of new 35-hp. Daimler; has aluminum center and tubular extensions; spring brackets, brake support and flange for bearing housing are a single drop forging. Aluminum rear axle (worm drive) of new 21-hp. six-cylinder Rover

trouble due to water and compression leakage. The first is the elimination of the usual water ports between cylinder block and head, and the provision of one or two elbows, or large water passages. The best of these variations appears to be the provision of integral elbows or hollow bosses at the rear ends of block and head, with a ring joint of rubber or copper and asbestos to form the seal. Thus the main gasket needs to hold only the compression. A further advantage resides in better water flow around the rearmost cylinders. In the new Beardmore engine a modification of this arrangement enables thermo-siphon circulation to be used in conjunction with an overhead camshaft. There are two outlet pipes, one from each side of the detachable head, in line with No. 2 cylinder, and similarly two inlets to the cylinder block from the bottom of the radiator.

Production Trend Outlined

The other trend referred to consists in forming the water ports in the cylinder block and head by jig-drilling them at the same time as the stud holes. This avoids trouble due to irregularities in foundry work, as when the "lands" between the ports and between the latter and the cylinder bores are reduced beyond a safe limit in some places. Not only is risk of leakage reduced, but the overlapping of gasket and ports, which often reduces the water flow, is prevented.

The new 20 hp. Sunbeam Six and the 18 hp. Star Six have been fitted with frictional torsion dampers at the front end of their crankshafts. The Sunbeam damper consists of a small flywheel frictionally held to the crankshaft extension, while the Star has a steel plate of approximately 9 in. diameter and ¼ in. thickness, held up to the front face of the fan-driving pulley by four helical springs. Where the spring bolts pass through it the plate is slotted to permit slight relative movement, a pair of centralizing or buffer springs being located in each slot, on opposite sides of the bolt. This Six is a continued model and the addition is said to have effected great improvement by damping out torsional vibration.

Unit power plants have not increased, nor have central controls. In the case of two-seaters—coupe and "all-weather" types—many of which are required to have a main seat wide enough for three adults abreast, central controls are out of the question, and a few makers who have standardized central gear and brake levers in the past are now offering to provide right-hand controls as an alternative without extra cost.

In clutches there is a definite trend toward the use of two driven plates instead of a single one, for besides the nine examples of twin plate clutches on new cars there are several continued models wherein single plate clutches have been displaced by the dual plate type, and some of these run in oil with metal-to-metal contact (steel or bronze to cast iron).

Some trouble has been experienced with single dry-plate clutches, and it is believed that the dual plate arrangement will mitigate the evils of overheating, rapid wear, fierceness and slipping, by increasing the frictional area.

Sunbeams have embodied a modification of standard practice in connection with single plate clutch design, for the driven plate is slotted radially, alternate segments so formed being set out toward one side and the other; the fabric rings are riveted to alternate segments, an arrangement which is said to prevent fierceness in clutch engagement.

The number of cars of all sizes (46 per cent) with four-speed gearsets has not increased; approximately half of the new models have that number of ratios, including some small fours and sixes. It is strange that four speeds are often provided with six-cylinder engines but only three speeds in the same makers' four-cylinder cars of less displacement.

Increase in Torque Tube Gearset Units

There is a slightly increased number of torque tube-gearset units. As regards propeller shafts and universal joints, three minor trends are worthy of note. The first is that where a metallic joint is used at the front end, its lubrication is cared for automatically by oil from the transmission casing. One plan consists in drilling the rear end of the main shaft so as to allow oil to leak through to the inclosed joint, while another consists in making the spherical housing of the torque tube end—and therefore the joint within—more or less open to the interior of the gearset. In either case provision is made to prevent oil leakage behind the joint. In the same way the rear joint of a few open shafts is lubricated by oil that passes through a ⅛ in. hole extending the full length of the bevel pinion shaft to the interior of the rear axle

casing. This is sometimes a cause of oil-throwing, however, when users over-fill the axle or adopt too fluid an oil for it.

The second minor trend is to return to at least one metallic *sliding* joint for open shafts. This is probably due to trouble having been experienced with fabric joints when the latter are called upon to take up variations in the effective length of rear springs with a lot of camber. Where approximately flat springs are used no trouble seems to be experienced with two disk joints, even when the "spiders" at both ends are fixed on the shaft.

The third tendency aims to eliminate vibration which has been traced to distortion of the disks at high engine speeds on top gear, permitting or causing the propeller shaft to run out of true. There are several examples of "spiders" being provided with a bearing that keeps the units of each pair centralized. A pilot extension of one with a hemispherical end is supported within a bush in the other, the end of the pilot extension being approximately in transverse alignment with the fabric disk.

Five of the new models have worm drive, and there is only one instance of spiral bevels having displaced the worm during the past year, on the Wolseley Fifteen. All-aluminum rear axle casings are increasing, in some cases without tie-rods, seamless tube reinforcements assisting to carry the load outside the spring centers; but twice as many new models are equipped with the pressed steel banjo type casing.

There is no new trend in evidence toward one or another type of rear springs. The use of alternatives to shackles has not developed largely, though both the new Lanchester and the Maudslay have inclosed rolls through slots in which the main leaves pass, with provision for sliding movement. While Lanchester uses this scheme only for the rear cantilevers, Maudslay applies it to the front half-elliptics as well, though the roller is there integral with the main leaf at the front end of each spring.

One small maker, the Turner Co., rivets a curved piece of spring steel to the underside of the side frame member above the quarter elliptic rear spring; the latter about midway in its length makes contact with this addition when heavy loads are imposed, and the effect, it is claimed, is to render the spring system automatically adjustable to the load.

Oil-less bushes for shackle pins have almost disappeared, and grease gun lubrication is becoming general. Over half of the total number of British cars of all sizes are supplied with spring "gaiters." These are generally filled with grease for the lubrication of the leaves, but a few gaiters are now in use which have oil cups attached to them and distributing wicks inside.

Lubricated spring leaves in many cases call for rebound dampers, and therefore one finds that approximately 25 per cent of the makers who fit gaiters supply spring checks as well. Morris on his projected output of 50,000 cars next year will fit Gabriel snubbers and spring gaiters, but as a rule on other cars the Hartford pattern is standardized, though the hydraulic (oil) types are occasionally supplied.

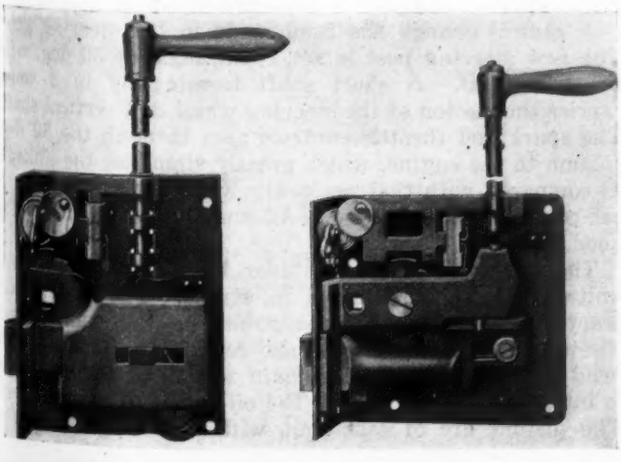
Steering Gear Trends

Worm and worm wheel steering still predominates, and the cam type has lost ground. Similarly, the hollow spoked steel wheel is most widely used; the disk type does not gain in favor, and a few makers who were using it last year have reverted to the other pattern named. Wire-spoked wheels continue to be almost exclusive to the highest grade and largest cars.

Straight-side tires, although they have been adopted by two or three additional makers, have not progressed materially and are fitted only by a half dozen makers altogether. The total number of makers using them even now does not reach half a dozen.

Balloon tires are being offered by British, American, French and Belgian tire makers; no car maker has as yet standardized them, though two or three firms offer to fit them at an extra cost. British car makers, however, are keenly interested in balloon tires, and a great many are testing them out. In fact, the Society of Motor Manufacturers & Traders has asked the Royal Automobile Club to conduct a trial of various makes, not so much to show which is best as to give an indication as to what may be expected of low-pressure tires in respect to durability, freedom from puncture, etc.

New Door Lock Requires Key Only for Opening

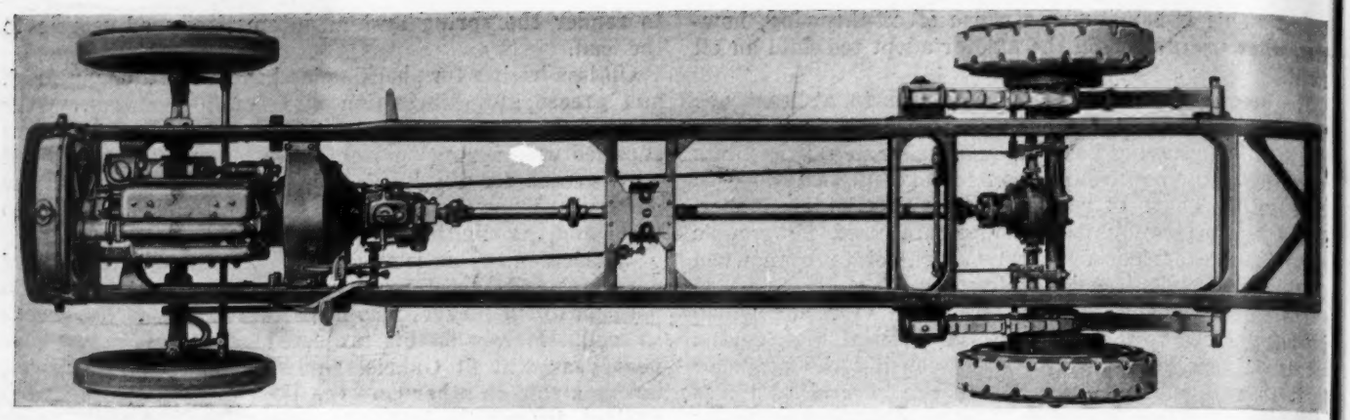


New form of door lock, with button locking device, made by English & Mersick

AN improved form of door lock which is easily secured against operation from outside the car by simply pushing a button or rod projecting above the top of the inside handle stem is now being manufactured by the English & Mersick Co. This is a rotary lever type of lock which, by virtue of the button feature, requires no key for locking, but is unlocked from the outside after the button is pressed only by use of a key. Absence of supplementary locking levers or turn buttons makes for clean upholstery work on the inner door panel.

One can see easily from outside the car whether or not all doors are locked by simply observing the position of the buttons on the top of the levers. The bolt is never locked, only the outside handle socket or follower.

This lock is produced in two grades, the cheaper one intended for medium and low priced closed car bodies and the other for the more expensive closed jobs. An additional advantage of this lock lies in provision for outside handle motion in either direction. Forty car builders have specified these locks as standard equipment.

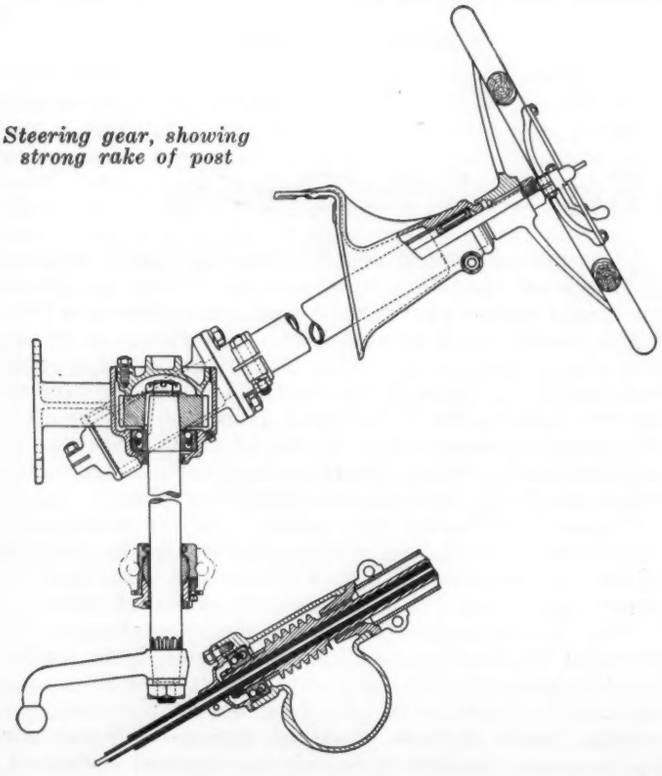


Plan of I. H. C. 3-ton truck chassis

New I. H. C. Truck Has Marked Changes in Engine and Steering Gear

Crankshaft is supported on two bearings. More rigid frame and heavier rear axle shafts are used. Internal expanding service brake replaces former contracting type. Steering post is set at 30 degree angle. Cooling by thermo-siphon.

A NEW 3-ton truck having an engine with its crankshaft supported on two ball bearings is now in production at the new Fort Wayne, Ind., plant of the International Harvester Co. This new model, known as the 63, supplants the model 61. Besides the new engine it incorporates other changes tending to make the parts affected more accessible and more durable.



Steering gear, showing strong rake of post

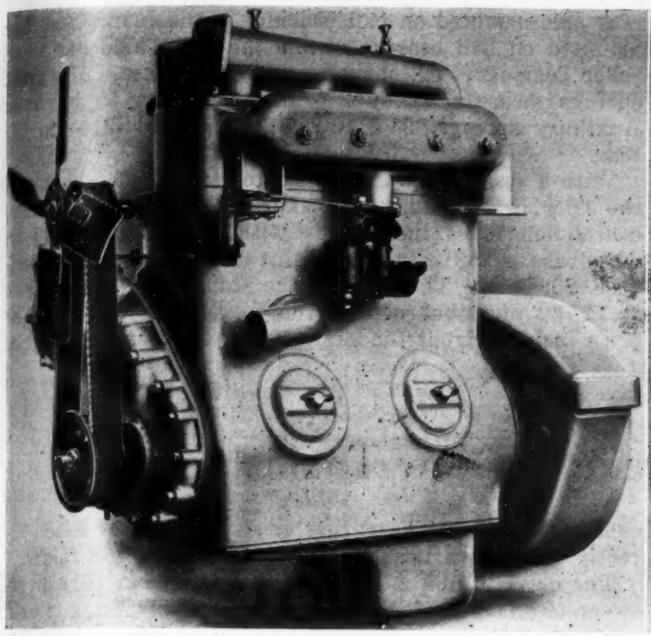
The new truck has a unit powerplant instead of a separate transmission amidships. The hand brake has been put on the propeller shaft at its point of division, instead of being on the rear wheels, and the service brake is now internal expanding type instead of contracting.

A more rigid frame is now used, the side rails being 7 in. deep and of ¼ in. stock, instead of 6 in. deep and of 3/16 in. stock. The rear axle housing and shafts are heavier, the frame has more cross members, and the tire equipment is now 36 by 5 and 36 by 8, front and rear, instead of 36 by 4 and 36 by 7. A heavy guard mounted to protect the radiator is standard equipment.

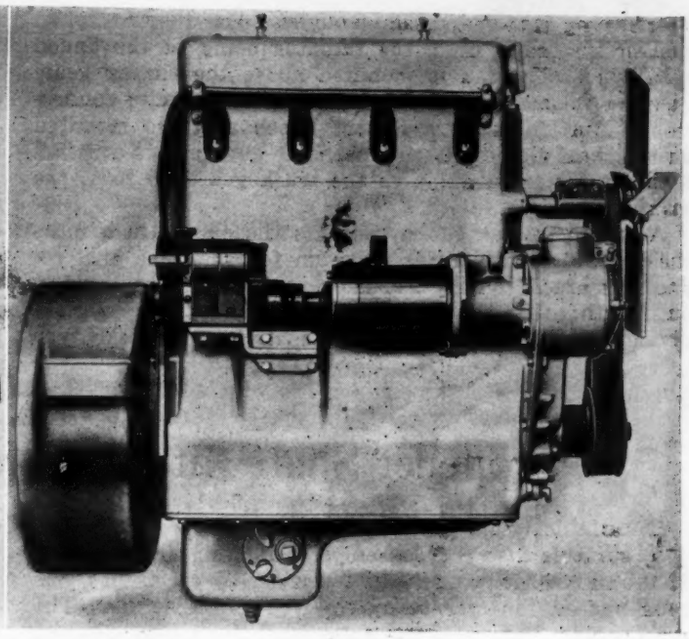
A radical change has been made in the steering gear. The new steering post is set at an angle of 30 deg. with the horizontal. A short shaft terminating in a worm carries the motion of the steering wheel to a vertical shaft. The spark and throttle controls pass through the 30 deg. column to the engine, which greatly simplifies the linkage, as compared with that necessary when the straight vertical colume was employed. All the linkage is under the hood.

The engine is a four-cylinder block-cast valve-in-head unit of 4¼ in. bore and 5 in. stroke. The unit powerplant is supported at three points on the main frame. The cylinder barrel sleeves are removable. The cylinder head is detachable and the main section of the crankcase is integral with the block. The oil pan is of pressed steel. The pistons are of cast iron, with four rings above the pin.

The two crankshaft bearings are of the single row ball type. The front bearing is of 2¾ in. bore, 5 29/32 in.



Carbureter side of I. H. C. 3-ton truck engine



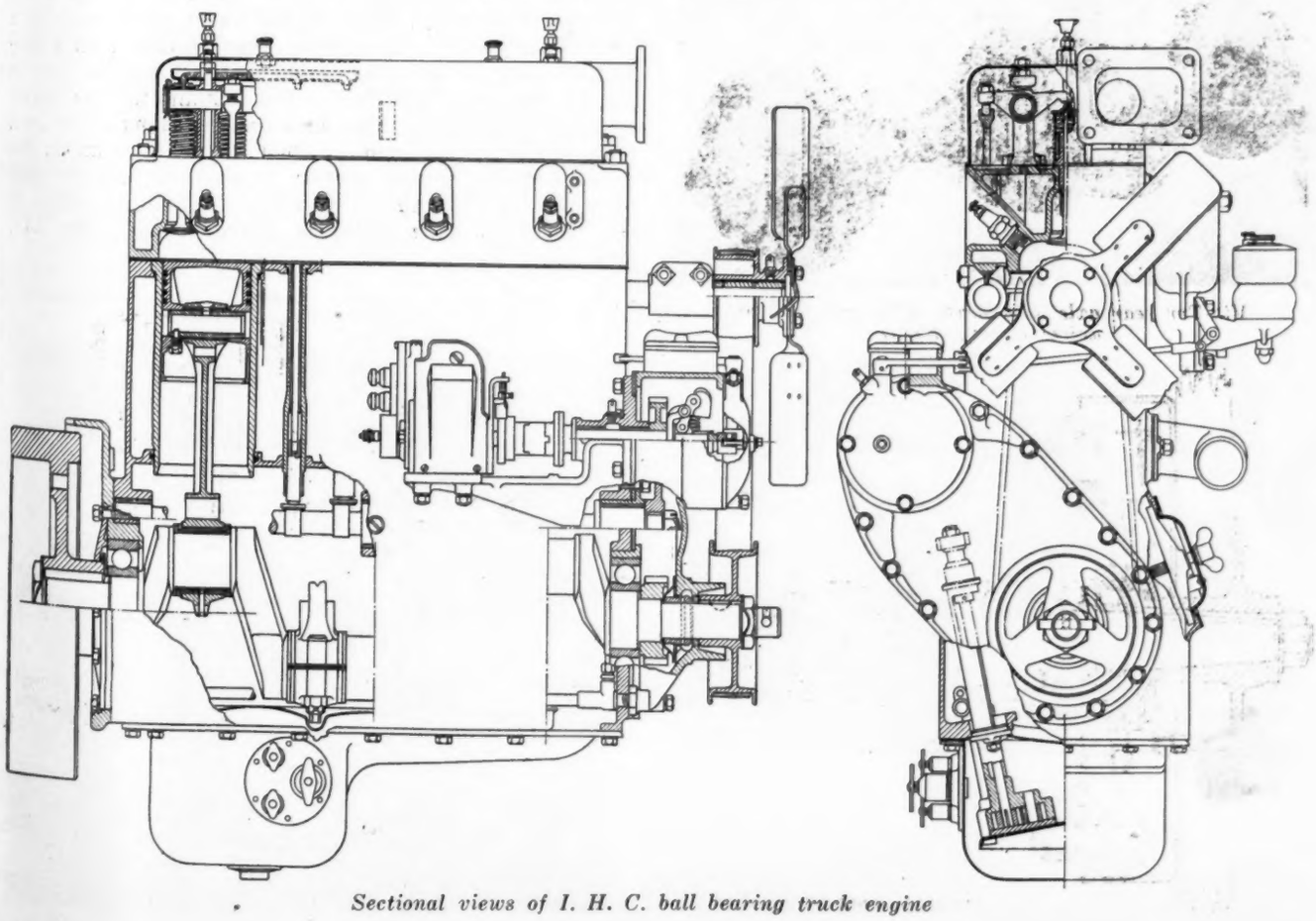
Magneto side of I. H. C. 283 cu. in. truck engine

outside diameter and 1⅜ in. width. The rear bearing is of 3 9/64 in. bore, 6 11/16 in. outside diameter and 1 17/32 in. width. The crankpin bearings are 2⅝ in. in diameter and 2¾ in. long. The camshaft bearings are babbitt-lined.

Crankshaft Warranty Issued

In connection with the introduction of the ball bearing type of crankshaft the International Harvester Co. issues a warranty by which it undertakes to replace free of charge the two-bearing crankshaft if it should break during the life of the truck and any crankshaft ball bearing which fails during the life of the truck.

The overhead valve motion is by mushroom tappets and pushrods, which actuate rocker arms on a rocker shaft mounted above the cylinder head. The valve adjustment, on the rocker arm, can be made while the engine is running. Lubrication is by a combination pressure and splash system, the oil being forced to the main bearings and



Sectional views of I. H. C. ball bearing truck engine

overflowing into the splash troughs. The thermo-siphon cooling system is used, the radiator being of the finned tube type. The fan is mounted above the timing gear-case, on roller bearings lubricated by an Alemite connection. Ignition is by a Robert Bosch magneto mounted on the right side of the engine. The governor is a flyball type set for 16 m.p.h. with the truck geared 9 to 1, the standard ratio.

A dry plate disk clutch connects the engine to a four-speed gearset with direct drive on fourth. The final reductions are 53 on first, 29.2 on second, 15.7 on third, 9 on fourth and 63 on reverse. The drive is through a divided tubular propeller shaft to an internal gear type rear axle mounted on ball bearings. The rear wheels are mounted on ball bearings while the front axle has taper roller bearings. All springs are semi-elliptic. The front springs measure 41 by 2½ in.; the rear, 56 by 3 in. Auxiliary springs, 33 5/16 by 2½ in., are fitted in the rear.

With a stake body and loaded to capacity the height of the floor is 44½ in.; with express body, 36½ in. The overall length of the chassis with the standard 140 in. wheelbase is 213⅞ in. and with the 165 in. special wheelbase, 239⅜ in. The price of the standard 140 in. chassis is $2,750 and that of the 165 in. chassis $2,835. The price includes front fenders, electric head and tail lights.

Propeller Shaft Internal Brake on New Taxicab Axle

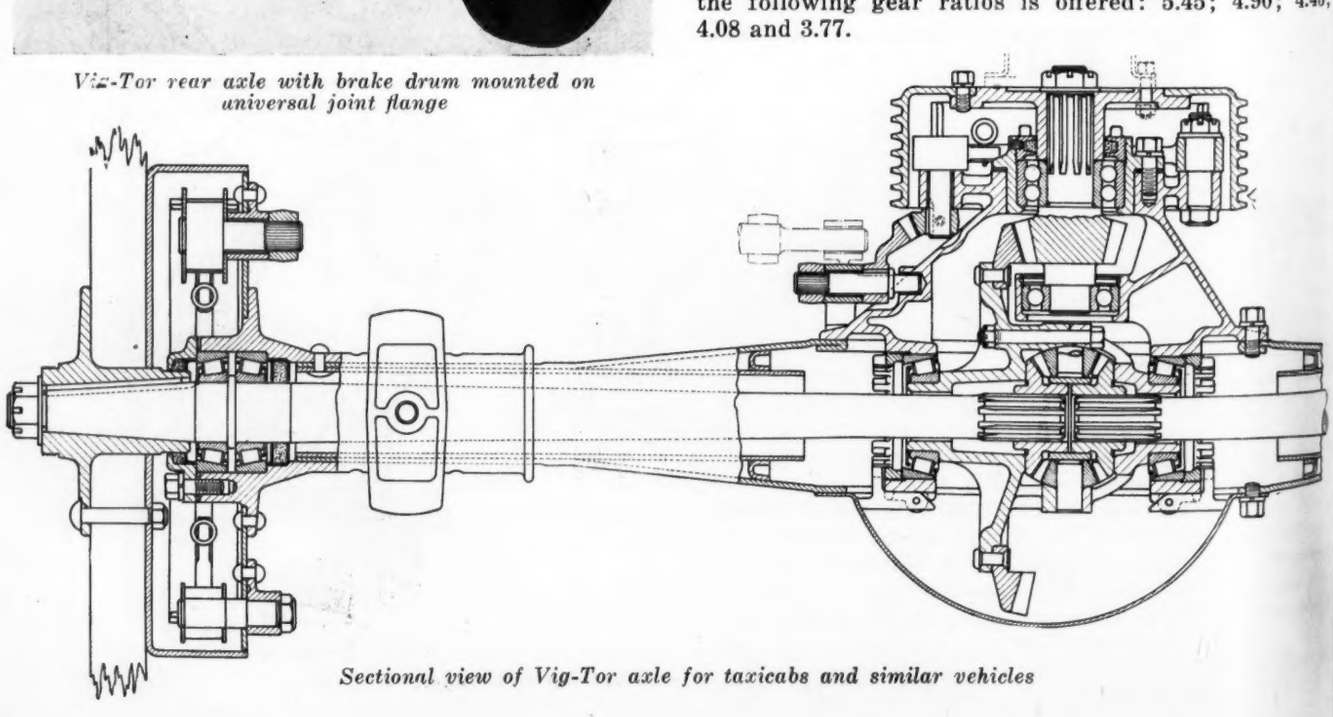
AN axle designed particularly for taxicab service and suitable also for passenger cars weighing between 3200 and 3800 lb., and ¾ to 1 ton delivery vehicles, has been put on the market by the Vig-Tor Axle Co. The outstanding feature of the axle, which is a semi-floating type, is the propeller shaft brake, which is mounted on the universal joint flange just forward of the drive pinion. The brake is equalized through the differential and has a 10-in. drum. Emergency brakes are fitted to the wheels. Another new feature of the axle is the shim adjustment of the drive pinion and wheels.

A departure from usual practice in semi-floating design is the use of two bearings for each wheel. These are claimed to have a greater combined capacity than is possible to obtain with the single bearing construction commonly used. The thrust of each wheel is taken directly on its own bearings, without butting the shafts.

The drive pinion is mounted in a one-piece carrier between two large ball bearings. This construction is used because of the ability to remove the pinion without disturbing the gear, or the gear and differential without disturbing the pinion. The axle is said to have been designed to permit of slipping the wheels under overload without over-stressing.

The drive, gear pinion and differential parts are nickel steel, case hardened and heat treated. The shafts are chrome nickel steel and the housing is of pressed steel in one piece. The hubs are drop-forgings. The wheel bearing and spring seat carriers are pressed on a taper and riveted. The axle is designed for Hotchkiss drive, although radius rods and torque arm can be provided if desired. The application of the brake is through a pull rod to a bell crank lever on the short shaft carrying a bevel gear sector. This bevel gear meshes with a companion gear on the brake camshaft. When the lever is pulled, the camshaft is rotated, expanding the brakes and applying them. The axle specifications allow for a load on the spring pads of 3000 lb. The maximum distance between spring centers is 40½ in. and the minimum, 37 in. The spring width is 2¼ in. An option on the following gear ratios is offered: 5.45; 4.90; 4.45; 4.08 and 3.77.

Vig-Tor rear axle with brake drum mounted on universal joint flange



Sectional view of Vig-Tor axle for taxicabs and similar vehicles

Accuracy Is Quality Chiefly Sought in Design of New Gear Hobbing Machine

Features incorporated for this purpose include large bearings, rigidly supported shafts, spiral bevel gears where practicable, and provisions against backlash. Net weight is 6840 pounds.

A NEW gear hobbing machine, known as the No. 44, has been announced by the Brown & Sharpe Mfg. Co. In designing this machine, which is intended for hobbing both spur and helical gears, the manufacturers have endeavored to omit nothing that would help to give accurately hobbed gears, not only while the machine is new, but after extended use. The features incorporated which tend to promote accurate work are large bearings, rigidly supported shafts, spiral-bevel gears where practicable and provisions against the development of backlash. Gears up to 18 in. in diameter and up to 3 diametral pitch in cast iron or 4 diametral pitch in steel can be cut on the machine.

The hob spindle is located close to the ways, which insures rigidity, and the heavy overhanging arm and arm brace provide a firm support for the work. For exceptionally heavy gears additional support is furnished by an adjustable rim rest. All hand wheels and controls are located on the front of the machine within easy reach, and the control is claimed to be simple.

A differential permits of the use of any feed desired, regardless of the gearing for the index or lead. By reason of the use of this differential only one set of lead gears is required for any number of teeth of a certain pitch and angle. The differential is automatic in action, becoming locked when a gear is removed.

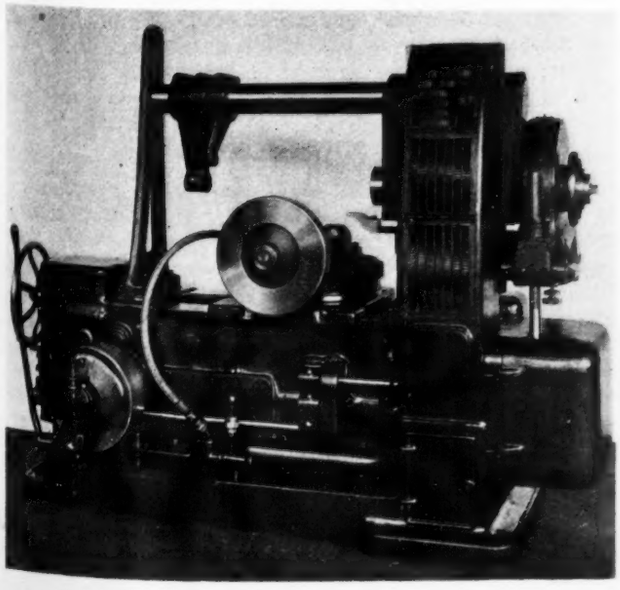
The machine is driven through a friction pulley, that is, a belt pulley containing a friction clutch. The construction used permits the hob slide to be moved back and forth by power when the hob is stationary. Motor drive can also be provided; the motor in that case being mounted on a bracket at the rear of the machine. A balance wheel on the hob spindle tends to steady the cutting action and to eliminate chatter. Only the cutting or hob load is carried by the hob spindle bearings, the hob spindle driving gear running in a separate, heavy bearing which takes care of the gear tooth load and the weight of the balance wheel.

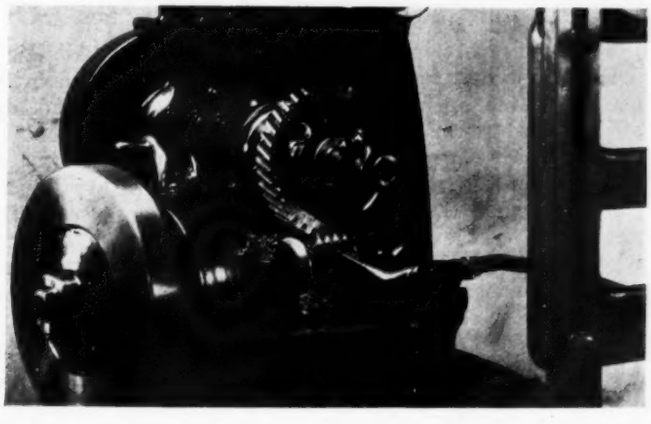
Full Range Available for All Gears

The hob swivel is graduated and may be swung through 90 deg. in either direction, settings to 5 min. of arc being readily obtained by means of a vernier. An advantage resulting from the fact that the hob swivel swings to both sides of the zero mark is that the full range of the machine, both in angle of helix and length of face, is available for cutting both right and left hand helical gears.

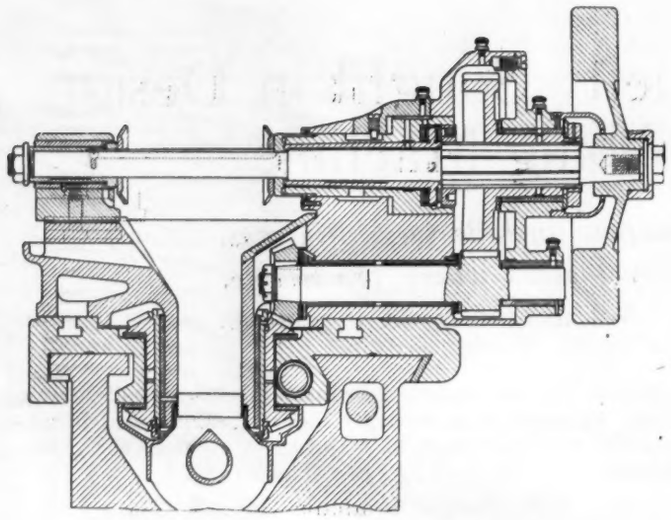
For any particular job the lead change gears are easily calculated, by means of a simple formula, and for a given pitch and angle of helix the gears remain unchanged. A thrust bearing is fitted to the sleeve of the index worm, by means of which any end play can readily be taken up. After loosening two nuts, the index worm can be operated by hand through a hand wheel and a fine adjustment of the work arbor obtained. This is said to be of great value in recutting gears, as the hand wheel has graduations to indicate the relative adjustments of the work arbor. The worm can also be dropped out of mesh, so that the index wheel can be turned by hand when truing up the work arbor.

The work spindle front end has a No. 16 taper hole with a 2½-in. hole through the center for holding shafts. It is fitted to receive a face plate or fixture. The work spindle slide is adjusted by means of a screw operated by a hand wheel, and the thrust of the elevating screw is taken on ball bearings. A dial graduated to thousandths of an inch indicates the adjustment. The outer end of the work arbor is supported by means of an overhanging arm equipped





New gear hobbing machine developed by Brown & Sharpe Mfg. Co.



Diagrammatic view of new gear hobbing machine

with arm braces. The arbor support is provided with an adjustable center if needed, or a bushing can be used. A device is furnished for re-locating the arbor support when the support has once been centered.

Feed change gears in the feed case on the right-hand end of the machine provide twelve changes of feed, in gometrical progression, from 0.010 to 0.153 in. per revolution of the work. These feed change gears receive their motion through transposing gears and a set of three bevel gears, which latter take care of the direction of rotation for right and left hand hobs.

The feed cases and differential mechanism are automatically lubricated by means of a pump in the feed case. Hob lubricant solution is pumped through piping and a flexible tube to a flat nozzle, which distributes the solution over the whole cutting surface of the hob. Oil guards mounted on the spindle prevent the solution from running into the hob spindle bearings. Chips and cutting lubricant, in dropping through the hob slide, do not come in contact with moving parts and therefore do not clog up bearings and gears. The chips are retained in the base and the solution is returned to the reservoir.

The floor space required at right angles to the hob spindle with covers open is 104 in., and parallel with spindle, 57 in. The net weight of 6840 lb. is said to be an important factor in enabling this machine to give rapid production without vibration or chatter.

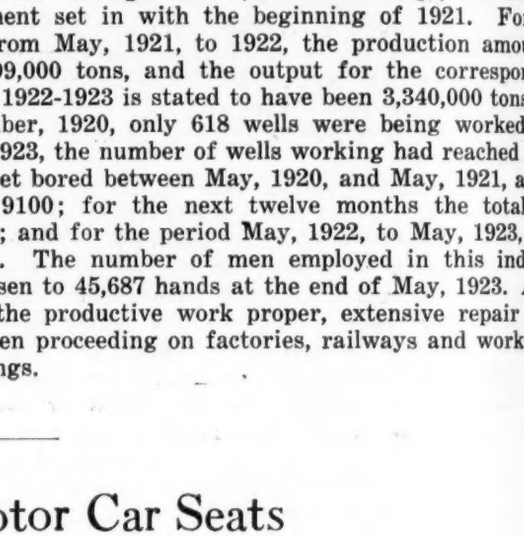
THE Baku oil industry, which has now been in the hands of the Soviet Government of Russia, is recovering. During the early months after the transfer the production receded very materially, from various reasons, such as lack of organization, willful sabotage, etc. An improvement set in with the beginning of 1921. For the year from May, 1921, to 1922, the production amounted to 2,799,000 tons, and the output for the corresponding period 1922-1923 is stated to have been 3,340,000 tons. In November, 1920, only 618 wells were being worked. In May, 1923, the number of wells working had reached 1650. The feet bored between May, 1920, and May, 1921, aggregated 9100; for the next twelve months the total was 37,900; and for the period May, 1922, to May, 1923, 105,000 ft. The number of men employed in this industry had risen to 45,687 hands at the end of May, 1923. Apart from the productive work proper, extensive repair work has been proceeding on factories, railways and workmen's dwellings.

An Air Spring for Motor Car Seats

THE accompanying illustration shows the Seibel air spring (made by the Seibel Air Spring Co., Inc.) applied to a parlor car chair. The air spring consists of three parts, an inner air container of rubber, an outer casing of fabric and rubber, and a deformer. The deformer is placed centrally below the bottom of the casing and serves to fold the walls of the casing inwardly until the product of the contact area and the air pressure is equal to the weight on the air spring.

The upper portion of the air container is of flat cylindrical shape and inclosed in a steel casing, which latter gives a sound anchorage for the spring casing and also affords a means of fastening the spring to the seat. The additional air capacity provided by the upper portion prevents a rapid increase in the air pressure within the air container when the load on the spring is increased. The parlor car seat swings around the supporting pole, but when used as a driver's seat a keyway is cut in the pole and a key inserted through the sliding sleeve, to prevent rotation of the seat.

Seats of this type would seem to be particularly suited to motor buses. One advantage claimed for them is that the position of the passenger on the seat is not changed materially by the action of the chassis springs and the back of the seat moves with the passenger. The upholstery of the seat, of course, need not be as heavy as ordinarily, and, as there is no motion between the passenger's back and the back of the seat, the wear on the upholstery is greatly reduced.



Seibel air spring seat for buses

Good Business in 1924 Predicted at Meeting of Automotive Equipment Association

Merchandising emphasis is being placed on parts and on shop equipment. Attendance at convention includes 240 jobbers and 270 manufacturers. Automotive-Christmas-gift campaign continued.

THE Automotive Equipment Association has held its largest convention and business exhibit. It was greater than any previous effort of the organization in attendance and business written at the show. At the two affairs, coincidentally at the Coliseum in Chicago and throughout the week of Nov. 12-17, approximately 3000 men of the industry were gathered together. The meeting of these men—manufacturers and jobbers and their sales and purchasing representatives—revealed the fact that the industry has passed through its biggest year and that there is general expectation that 1924 business will be even larger.

Jobbers from all parts of the United States and Canada reported their dollars-and-cents volume running 30 to 50 per cent ahead of last year. This does not mean that all manufacturers in the industry have shared in the increase. On the contrary, business in fads and novelties has dropped off, because jobbers have been paying more and more attention to standard lines of accessories, replacement parts and shop equipment. Particularly have the jobbers been merchandising replacement parts and shop equipment, which in many territories had been allowed to slip, or were fast slipping, into the hands of specialty distributors. There are still many jobbers who are not working at high efficiency in either or both of these lines, but the trend, as indicated at the convention, was to departmentize jobbing houses and build up or win back these two lines of business by putting competent men in charge of their promotion.

In many ways the A. E. A. gathering was one of the most notable assemblages in the history of the automotive industry. It brought together under one roof the products of 237 manufacturers. It attracted for business conferences in the show after official meetings in the convention about 240 jobbers and 260 or 270 manufacturers, nearly 2000 manufacturers' and jobbers' salesmen and buyers, and about 150 passenger car manufacturers and non-member jobbers who were specially invited to attend.

High Standard in Exhibits

In general, the exhibits in the show were of a higher standard than in previous years. Fewer articles of a fad nature were shown and the exhibits of standard merchandise showed much thought in the preparation of booths. Fully as much attention was paid to suggestions for jobbers' and dealers' advertising and display activities as to the exhibition of merchandise. Some exhibits were striking examples of window and counter display, representing ideas which jobbers and their salesmen might pass on to retail merchants.

As in past years, the retail trade and the public were excluded from the business exhibit, which is purely a wholesale trade show.

The important acts of the convention were authorization of an expansion of the merchandising movement and research into the cost of doing business in the wholesale automotive equipment field. The research, in which it is hoped that 200 or more jobbers will cooperate, will be financed by the association and conducted by the Harvard Bureau of Business Research.

The object is to compile comparative information which is expected to assist jobbers in working out economies in their individual businesses and to inform manufacturers regarding equitable advertisements and other details of sales policy. The men behind the survey movement have a hope in the back of their minds that the information obtained may pave the way eventually for a lessening of the cost of distribution.

Merchandising Activities Continued

The merchandising movement will continue the "Ask 'em to buy" and "Shop profits" campaigns and will repeat and elaborate the automotive-gifts-for-Christmas campaign next year. An additional step will be a campaign for the development of service and maintenance business. It is proposed to prepare an educational motion picture and literature intended to assist the retail trade in organizing for service and maintenance business and developing it. For the manufacturers and jobbers, the object, of course, is to promote the sale of replacement parts.

Official reports and unofficial conversations about the convention showed that the Christmas campaign has taken a big hold on the industry. This year more than 100 manufacturers have provided holiday Christmas wrappings and advertising helps for their products, and a great majority of the jobbers throughout the country are making special drives to promote the automotive-gift idea among their dealers. The association has distributed half a million automotive Christmas gifts sales helps and individual manufacturers have provided the trade with fully as many more.

The association financed the expansion of the merchandising movement and the survey of business costs by increasing the dues from $200 to $400 a year. This will provide an operating budget in excess of $200,000.

The new association president is W. E. Wissler of the Herring Motor Company, a Des Moines, Iowa, jobber. W. T. Morris of the American Chain Company, Bridgeport, Conn., was elected vice-president. The chairman of the board of directors is N. F. Ozburn of the Ozburn-Abston & Co., Memphis, Tenn., jobber. William M. Sweet of the Klaxon company is vice-chairman.

The convention had a brief sensation in an attack on the board of directors and Commissioner William M. Webster, managing officer of the association, by E. B. Gallaher of the Clover Mfg. Co., Norwalk, Conn. Gallaher charged that the governing authorities had exercised arbitrary power. His resignation was unanimously accepted and the officers and directors of the association were given a vote of confidence.

Regular Schedules and Maximum Safety Needed in Commercial Aviation

Edward P. Warner, Massachusetts Institute of Technology, tells Metropolitan Section of S. A. E. that progress of air transport will be slow unless these ends are achieved. Many bankers are becoming interested in aeronautics, according to Augustus Post.

UNTIL several efficient organizations are able to show the public actual flying, constantly operated on regular schedules, with a considerable saving in time over other means of travel, commercial aviation will continue to make only relatively slow progress. This was the chief idea brought out by the paper on "Commercial Aviation in 1923" read by Prof. Edward P. Warner of the Massachusetts Institute of Technology before the Metropolitan Section of the Society of Automotive Engineers at the Automobile Club in New York on Nov. 16. Speakers in discussion agreed with the general conclusions of the paper.

At the opening of the meeting a resolution was adopted to nominate Dr. S. P. Langley as a candidate for the Hall of Fame in the New York University, in view of his pioneer research activities in connection with aviation.

The paper, which is printed in condensed form on the following page, dealt at length with the development of the various European air routes, the direct effect of subsidy payments on these lines, and the chief difficulties encountered in the promotion of aviation in the United States. The magnificent regularity and precision of the U. S. Air Mail was also a topic of considerable interest. Professor Warner thinks that the reasons back of the heavily subsidized European routes lie in political motives of several governments, the actual passenger carrying efficiency of many of the air lines being of secondary consideration.

Referring to aircraft development in the United States, Professor Warner states that the technical developments and achievements are far greater here than in any other country.

Difficulties in the way of expansion of commercial aviation may be attributed to four major facts:

1. High costs.
2. Irregularity of services.
3. Distance of operating fields from center of cities.
4. Supposed danger of air travel.

Continuous Service Makes Profits

Letters were read from W. B. Stout of the Metal Aircraft Corp., Detroit, and Alexander Klemin of the Cox-Klemin Aircraft Co., College Point, heartily indorsing Professor Warner's paper. Stout's letter points out that a commercial airplane, in order to make money, must be kept in the air at least six to twenty hours each day, and that engines must be replaced in similar manner and with almost the same speed that a train changes locomotives. Warner rejoined that it would be a simple matter to keep an airplane in the air for twenty hours a day, but the trouble lies in keeping an engine running for that period.

Charles F. Redden of the Aeromarine Co. expressed the opinion that commercial aviation should endeavor to concentrate in operating from one central point, using a number of routes extending outward within a radius of 200 to 500 miles. He spoke of the successes of his company in operating large flying boats on the Cleveland-Detroit, New York-Atlantic City, the Havana-Key West routes and the transportation of the whole air fleet from the north to the south of the country twice a year, a distance of over 3000 miles in each direction. Twenty-six thousand paid passengers, or 30,000 total, have been carried in their machines. On the Cleveland-Detroit service in 1922, 272 round trips were made and an actual perfect percentage of 100 round trips obtained. He was not in favor of a private enterprise endeavoring to cover a single stretch of 3500 miles similar to the undertaking of the air mail.

Bankers Investigate Aviation

Augustus Post said that the great bankers and financiers in the country are showing considerable interest in aeronautical affairs and are only waiting for an opportune time to step into commercial aviation. To be successful commercially the business day must be augmented by continuous night flying. He maintains that dirigibles are the logical types for long distances or stretches over 1000 miles in length.

R. B. C. Noorduyn of the Fokker Company spoke in detail of the experiences of various European air lines. Concluding, he mentioned fog as being the only weather element that should hinder continuous aircraft operation. It has been demonstrated and proved that it is possible to guide an airplane through fog to a landing field by means of "directional" radio communication.

Another speaker gave some enlightening information on the night operation of the air mail. For over two years the air service has been experimenting with different types of searchlights in order to inspire the greatest confidence in the pilots flying over "dark" stretches and also to insure maximum safety. At each of the four terminals along the night routes are two 36-in. searchlights with a candlepower of approximately 450,000,000 each. Every 25 miles are 18-in. incandescent arclights and every three miles are acetylene gas beacons similar to those used for directing street traffic. Four times on this route the pilot should be able to see these three lights at the same time.

At the finish of the discussion, moving pictures were exhibited by the U. S. Air Service depicting the Army bombing trials conducted off the Virginia Capes Nov. 15, 1923, when the discarded battleships Virginia and New Jersey were sunk by 1100 lb. bombs. Another film exhibited by Redden showed the operation of the Aeromarine boats along the Atlantic shores.

A condensed transcript of Professor Warner's paper follows:

WHETHER we look to Europe or to the United States, the most striking change in practice that has been made since 1920 is a rearrangement of routes, with a constant tendency toward the covering of longer distances. It was felt when commercial flying first began that the development of the airplane at that time would make it uneconomical to fly more than 250 or at the most 350 miles without a stop, and that unbroken journeys longer than that must be left to the airship, a means of transport which was not then available for commercial use anywhere outside of Germany. While the fundamental premise was sound, the resulting action was not, in the light of subsequent experience, altogether wise.

In studying European development, and particularly in analyzing the reasons behind the choice of routes, it must always be remembered that transport by air, like every conceivable phase of human activity, has been viewed to some extent as an instrument of foreign policy. The extension of air lines and the granting of subsidies have been dictated largely by the desire to establish contact with neighboring nations whose friendship is desired and by the kindred desire to improve to the utmost communication with the outlying parts of a great empire.

Politics Affect Efficiency

Where a political motive for governmental action in an industrial matter exists, the efficiency of conduct of the enterprise is likely to fall into the background and to receive but little consideration. While it would be unjust to bring any general charge against the technical efficiency of the air lines—for many of them have given distinguished demonstration of possible economy and safety and regularity of operation—it is fair to say that many lines are being run today which have no commercial justification for existence, and which live solely to obtain a government subsidy. That is a lamentable condition of affairs, for where the passenger is not needed, where a line can run profitably without carrying passengers, there is but little incentive to improve equipment or to introduce the most efficient methods of going after new business.

Indeed, one would almost suspect, from the conditions imposed upon the passenger by some of the air lines, that his presence on board the airplane was regarded as a distinct nuisance hardly to be tolerated, and such companies have only themselves to thank if they are unable to get business when they may need it. As an illustration of the way in which the prospective passenger, not conversant with flying, is repelled, a few paragraphs may be quoted from a translation of the very lengthy contract to which every ticket buyer must place his signature before being allowed to ride on a certain European air line:

> "Art. 5. The company's time-table is only approximate. The company reserves the right to modify in any manner desired the day and hour of the departure of the airplanes, and the passengers have no redress as a result of such changes.
>
> Art. 6. Neither the company nor any of its agents assume any responsibility for delay or interruption or termination of the journey. The passengers will be responsible for the payment of all expenses to them resulting from such happenings and all their indirect consequences.
>
> Art. 7. The company and its agents deny all responsibility for accidents, losses, delays, or injuries of any sort whatever which may occur to the passengers or to their property during flights of the company's airplanes, whether they arise from fog, wind, forced landings, changes of routes, changes of airplane used, strikes, fire, theft, or from any other mishap connected with aerial navigation, whether occurring while taking off, while on the ground, or while in full flight. The company will not be in any way responsible for the mistakes or the negligence of its pilots or of any other persons on board the airplanes."

Such stipulations can hardly be expected to improve the prospects of development of air transport, and if the airplane cannot run without terrifying the prospective customer in this way it has no right to run at all. Air lines must solicit business on the same basis as other transportation enterprises. An increase in speed does not justify great sacrifices in other directions.

Public Must Be Sold

The general public is showing little inclination to travel by air, in spite of the feverish activity which has been shown in the starting of great numbers of new lines in some parts of the world.

What is the source of this prejudice against travel by air? Why this unreasoning fear, as it seems to those who have flown themselves, of getting away from the ground?

The first and the most powerful source of the hesitancy with which air transport is regarded is undoubtedly its supposed danger, a danger which is multiplied manifold in the public mind.

The public will use the airplane when satisfied that time can be saved and that safety can be counted upon, and the only way to satisfy the public on those points is by the operation of airplanes. No amount of theorizing will be of any assistance.

In speaking of the advantages which would result from large scale operation, I have made no mention of economy, but that, of course, is obvious. The maintenance of ground engineering and mechanical staffs at two or three or more fields for the purpose of welcoming one or two airplanes every twenty-four hours is a procedure entirely outside the realm of practical business. It finds no parallel except in the handling of ocean liners at their ports and the need which exists there for a few units of very large size and operated at comparatively infrequent intervals is not duplicated in connection with the airplane.

A reasonable early escape from these difficulties seems possible only if air transport can be "sold" to a portion of the financial community, or if direct support is secured from the government.

Government Aid Needed

If no patrons for commercial flying are found to risk losses for a few years in the hope of later reaping rewards commensurately great, it follows that the government is the only hope. What European governments have already done is now fairly well known. All of the great states and many of the small ones are granting direct subsidies, subsidies which are in some cases, as already mentioned, of such generosity that the revenue from the passenger fares and from express matter is negligible in comparison. One French line during 1921 actually received more than 95 per cent of its total gross revenue in the form of direct subsidy payments.

There is no thought of direct subsidy in the United States. The ultimate benefit of such a grant is very questionable, and the spirit of the American people seems overwhelmingly opposed to undertaking experiments in that direction. That, however, does not obviate the possibility of governmental assistance extended through the provision of ground organization facilities and in certain other directions.

It goes without saying that the laying out of landing fields is a function of government, either national or local.

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High Time to Standardize Tire Sizes

WITH nearly everyone prepared to adopt balloon tires either as optional or as standard equipment, with tire manufacturers waiting to tool up for production, and with prospective retail purchasers anxious to give the new tire a good trial, few if any makers are really ready for production. All of which is due to failure to agree upon standard rim sizes.

This situation has been apparent for months in the tire industry. Some rather feeble efforts have been made to get together, but nothing has come of them. It looks now much as if one company would jump in one direction and another in another and then each try to match the other's effort, with the result that we shall have a fine miscellany of sizes numbering twice or thrice those really needed.

Tire men say that no two customers among the car builders can agree as to the most suitable sizes and the automobile executives reply that the tire companies cannot agree among themselves as to the best sizes. They assert further that tire and rim organizations have refused repeatedly to cooperate in proposed standardization work carried on through the Society of Automotive Engineers, which is the recognized clearing house for such efforts in automotive circles.

Trade jealousies, which have prevented much needed cooperation, should long since have been outgrown. It now seems likely that they will come home to roost, bringing with them the prospect of serious increase in dealer stocks and very heavy expenditures for new production equipment, much of which would have been quite unnecessary if some centralizing agency with real authority or a genuine desire to cooperate could have brought the varying interests together and composed their differences.

It may be too late now to avoid most of the grief which might have been avoided, but it is not too late to take steps to prevent recurrence of similar situations.

Conditions in the tire industry are none too healthy and are not likely to improve unless some way is found of composing differences. The time may come when banking interests will call a halt.

Real Automotive Leadership

EVERY now and then we hear of another leader in the automotive field who is devoting a good share of his time to a study of the broader problems which confront the industry. These men are not actuated by selfish motives, for whatever they do in this direction will help others just as much as themselves. They have a clear vision of the future, however, and they realize that the scope of the market will depend upon the degree of wisdom and courage with which the major questions of highway transport are attacked.

Highway construction, maintenance and financing, expansion and regulation of motor vehicle common carriers of freight and passengers, handling of freight in congested terminal areas, relief of street and highway congestion, greater parking areas, and reduction of the accident hazard, are some of the great issues involved.

These, rather than economic considerations, are what will build up sales resistance and have done so already to a certain extent. The price of the motor vehicle has been brought so low that there are relatively few American families which cannot afford the original cost. Potential buyers are deterred in many cases by the aftermath of maintenance and garage charges. In many others they do not buy because they can find no parking space near office or shopping districts. In still more they refrain because of the difficulties encountered in driving in dense traffic and it must be admitted that it is becoming constantly more difficult to find even a remote country road where traffic is not congested.

For every one engaged in the manufacture or sale of automotive products these are practical problems. Everything which tends to circumscribe the market makes competition keener and profits smaller in a field where production capacity exceeds probable demand. Every additional mile of improved highway and every additional acre of parking space enlarges the prospect list of some dealer. Production schedules are dependent upon the aggregate of dealer sales.

As we have said before, the purchasing power of the American people is so great they can buy as many automobiles as they want. The only question is how many they are going to demand. The will to buy will be limited in future by such considerations as traffic congestion rather than by a lack of desire for individual transportation which is inherent in everyone.

While the automotive interests have a selfish interest in the solution of these problems, they never have viewed them from a purely selfish angle. They always have been impelled by a desire to serve the public interest. They have been big and broad enough to know that this factor rather than profits must be given primary consideration. In this respect they have been far in advance of their older brothers in the field of transportation.

No question is of greater immediate import than that of transportation. It is big enough to justify the leaders of the industry in devoting their time and effort to it and it is broad enough to call for the active assistance of every person in the industry. Future profits will depend in larger measure upon the manner of its solution. If intensive study is not given it by the men most vitally concerned, and by all of them rather than a few, other interests will undertake the work with results which will be far less satisfactory.

Bankers Hard to Educate

MUCH effort has been expended in educating bankers to the fact that the automotive industry is built on a solid foundation, but it appears that they are mighty hard to teach and that many of them have not yet passed the primary class so far as their knowledge of the motor vehicle trade is concerned.

Study of the report on automobile financing presented at the annual meeting of the Investment Bankers Association at its Washington meeting will be profitable, if it does nothing more than disclose the mental attitude of the men who compose this organization. They admit that it is possible to find in the industry much mortgageable property upon which to base bond issues, but that securities based on current assets and earning power should be very carefully scrutinized. That is quite true, but it applies with equal force to all industries.

The trouble with bankers in their dealings with automobile companies in the past has been that they haven't been guided by the first principles of caution and common sense. There are many companies which are as sound as the proverbial dollar, but there are others which aren't now, were and never will be. Yet companies which never had more than a gambler's chance for success have had little difficulty in getting bank support.

Unhappy experiences with such concerns seem to have produced the conviction that they are all alike. That isn't any more true of the automotive business than it is of the clothing trade. When the public has suffered from the purchase of securities issued by investment bankers in behalf of companies which a little sane inquiry would have disclosed were foredoomed to failure, the fault has been the banker's and not that of the automotive industry. We don't hear a blanket condemnation of the oil industry, which is more prolific of swindles than any other.

Ignorance of actual conditions also is shown by the emphasis placed by the report upon the used car situation. There is truth in the contention that production slows up when there is a big surplus of used cars, but the bankers appear to think that all manufacturers actually handle used cars themselves. This notion is wholly without foundation except as it applies to factory branches.

It is quite plain that the campaign of banker education must continue indefinitely.

Evidences of Stabilization

AMAZING as was the production of 393,000 in May it was not so astounding as an output of 360,000 in October, which, in most previous years, has marked the beginning of a fall and winter decline. It may be significant of future tendencies, however, that while production last month was 51 per cent greater than for the same period of 1922, October of last year showed a material gain over September and it was the fifth biggest month of the year, while November was sixth and December seventh. The poorest months both last year and this year were January and February.

If there is any significance in the figures, it must be that the industry is becoming stabilized to a greater degree and that seasonal fluctuations will not be so marked henceforth as they have been in the past. This undoubtedly is due to three factors:

1. Expansion of the improved highway system.
2. Lower prices for closed cars.
3. Snow removal work in winter.

Nothing could work to the greater advantage of the industry than elimination of sharp ups and downs in business. Tendencies are all toward stabilization which will permit maintenance of more nearly uniform manufacturing costs. There is no apparent reason why manufacturers cannot hereafter make commitments for their minimum requirements over longer periods and take advantage of market fluctuations.

Another Blow to Pessimists

CONSIDERABLE surprise is being expressed in financial circles at the large number of industrial corporations which are declaring increased or extra dividends. It seems to have been assumed generally that profits for the year would not be entirely satisfactory, notwithstanding the large volume of business.

Here, again, the bears appear to have been without accurate information concerning actual conditions. It undoubtedly has been true that profits per unit have been lower, but this makes comparatively little difference when the volume of units is large. Not only have sales been heavy, but nearly all companies have effected substantial manufacturing economies.

When the complete record of business for 1923 is written it will be seen that there never was less excuse for pessimism than there has been this year.

First Part of Month Shows Big Schedules

Manufacturers Recommend That Dealers Store Cars for Spring Delivery

NEW YORK, Nov. 19—Contrary to expectations, reports from automobile producing centers for the first week of the month indicate an increase in output over the first week of October and a production greater than any week in that month. This is surprising in view of the fact that a number of producers planned to curtail operations to some extent in November because of inventory taking, plant readjustments to prepare the way for renewed activity to meet spring demand, or to the usual slackening in sales.

Through its output of 361,000 cars and trucks, October became classified as one of the high production months of the year. Whatever slowing up may come toward the latter part of November resulting in the reduction of totals from the October figure will be due to normal causes and not to any unusual factor either in the manufacturing or sales field.

Ford Not Included

The reports for the first week of this month do not include Ford operations, which the company stated would be lightened somewhat during the month. At the same time, Ford reports that sales by dealers are running even with factory output and that dealers are unable, because of the retail demand, to stock cars at this time.

Manufacturers are recommending that dealers begin the accumulation of a reasonable stock in order to meet the anticipated heavy demand in the spring and to assure themselves of their ability to make ready deliveries. With somewhat of a falling off in sales throughout the country as a whole and with manufacturers operating on good size schedules, this will be possible, advice indicating that so far this year there has been no general move by dealers to prepare stock for future call.

Sales are continuing at a good pace despite the fact that the industry has entered a usually dull period and retail business for a number of months has been maintained at a uniformly high level. There has been no disturbing element in the slowing down since the buying movement started in earnest and plant operations, likewise, since the early part of the year have been keeping on an even keel.

Other branches of the industry report satisfactory conditions with a marked advance over last year noted in both the manufacturing and selling ends. Equipment makers report an exceptionally good fall in point of sales. Truck production is following its conservative pace with operations concentrated to a large degree toward meeting the demand for buses. Some improvement is noted in tire sales.

Business in Brief

NEW YORK, Nov. 19—Although it is evident that there has been a quieting down in industry as a whole, the fact remains that trade really is better than a year ago, with collections somewhat improved and current buying ahead of prewar days.

As further indication, car loadings still are keeping up at a record breaking pace, topping the million-a-week rate which has been maintained for more than six months. Building operations, also, show considerable life, October returning the third largest monthly expenditure in history. American cotton consumption is heavy, October having been the best month since last June.

That is the bright side of the picture. Looking in another direction, petroleum production and refining are reported depressed, while Illinois, Ohio, West Virginia and Alabama report shutdowns of soft coal mines, with prices the lowest of the year. Pig iron prices are a third lower than the April peak, while the steel industry finds that unfilled orders are being run off faster than new business is coming in.

Unemployment is reported, but this does not seem disturbing. While the South finds many negroes drifting down from the North seeking work, on the other hand New York City building workmen are asking $1 a day more after the first of the year. With the leading New England cotton mills there is considerable activity.

Bank clearings aggregated $7,170,884,000 for the week ended Nov. 15, which is an increase of 1.3 per cent over the preceding week, which had a holiday in it. This is a decrease of 1.2 per cent from this week last year.

Crops seem healthy, with the movement of grains moderate. Prices have declined slightly, with wheat showing the greatest drop.

Stocks and bonds are reported active and irregular.

Agree on Standard Balloon Tire Rims

Big Savings Will Be Effected if Sizes Approved Are Put Into Practice

NEW YORK, Nov. 22—Standard rim sizes for balloon tires have been agreed upon by leading tire manufacturers as the result of a series of meetings which were concluded yesterday. Practically every important producer was represented in the conferences, which brought about a determination to standardize on the following sizes:

	Tire Sizes
21 in. rims for	29 x 4 in. 31 x 5 in. 33 x 6 in.
20 in. rims for	32 x 6 in. 34 x 7 in.

It is expected that thousands of dollars will be saved to the industry and the public if the conclusions of the conference can be carried into actual practice.

Tire men who commented on the question after the meeting agreed that the success of this standardization effort depends very largely on the cooperation given by passenger car manufacturers. Adoption of the standards outlined would necessitate at least minor design changes in the case of certain vehicles. The revisions required probably would be of little consequence in most instances, however, as compared to the economic saving effected by conforming to the standard.

American-British Files Petition in Bankruptcy

BRIDGEPORT, CONN., Nov. 22—Troubles of the American-British Manufacturing Co., with plants here and in Providence, have brought the concern into the courts, a voluntary petition in bankruptcy having been filed.

The concern has been dormant for some time, and its huge plant here has been on the market. During the war it manufactured big cannon and military accoutrement. At one time it was an important factor in the automobile industry as a builder of engines. From 1919 to 1922 it manufactured the Porter car, designed by Finley Porter.

Ford's Glass Production Nearly Equal to Demand

DETROIT, Nov. 20—Ford Motor Co. will have a glass production capacity of approximately 20,000,000 sq. ft. annually after the first of the year at its Glassmere, Pa., River Rouge and Highland Park plants.

One furnace is now operating at the Rouge, fires have been lighted under the second and the remaining two are expected to be operating soon after Jan. 1.

Company requirements at present call for 20,500,000 ft. a year.

C. F. Kettering Urges Better Service Policy

He and Other Speakers Discuss Problems at N. A. C. C. and S. A. E. Meeting

DAYTON, Ohio, Nov. 21—Service, which in all of its phases contributes to more satisfactory transportation, must be sold with all of the dignity and dependability that characterises the finest business enterprise. This was the outstanding thought developed by the joint service meeting of the National Automobile Chambers of Commerce and the Society of Automotive Engineers, held here and attended by 150 representatives of both organizations.

Four Meetings Held

There were four meetings. The first was addressed by Charles F. Kettering, who, in a characteristic speech, pointed out the need for better fundamental economical service. He stated that the service department occupied the key positions in the present motor car situation, that unless better basic business methods were formulated the whole industry would suffer. Better service and fairer replacement parts prices must be achieved, as service consists of more than selling repair parts, he said.

A tentative platform involving an adequate educational and cooperative plan was adopted. Plans for a complete service equipment exhibition in conjunction with the spring meeting were included. The session was concluded by a paper on "The Evils of Head Lamp Dimming" by R. E. Carlson of the Bureau of Standards, forming a contribution to safety efforts of the N. A. C. C. service committee.

Flat Rate System Taken Up

During the afternoon session various aspects of the flat rate system were discussed from the viewpoints of both manufacturer and dealer. Don T. Hastings spoke on "What Lessons of Value to the Engineer Has the Flat Rate System Developed?", while J. Willard Lord addressed the meeting on "How the Engineer Can Cooperate to Make the Flat Rate More Successful." These papers indicated that great advance is slowly being made toward greater accessibility and simpler construction, although manufacturers' standard repair parts prices are to be severely criticized.

A graphical service complaint chart was presented by O. T. Kreusser, which portrays field troubles quantitatively and with relation to mileage, providing an accurate index of the value of design. His paper, providing the engineer with service data to improve design, also suggested the way to obtain dealer cooperation in this line of effort.

On Wednesday morning the problems of crankcase dilution were discussed, chiefly from the standpoint of owner education. E. F. Hallock in his paper, "The Evils of Crankcase Dilution—How to Help the Public," made definite recommendations for service education, and T. A. Waerner dealt with the same problem from the design angle in "What Can the Engineer Do to Help the Public?". The policies and effort of the National Cash Register service department were outlined in a comprehensive paper on selling service by W. L. Wise. He demonstrated that service of the most adequate nature can be sold rather than given away after thorough organization and education of the service department, which is given all of the business characteristics other department.

In the afternoon the electrical phase was discussed. Both speakers emphasized the great need for greater accessibility and improvement of terminal and wiring practice, as well as more educational effort. The repair man's phase was set forth by P. J. Durham in a survey of the electrical repair problems as encountered in the field, while "What the Engineer Can Do to Simplify Electric Repairs" was covered by J. W. Tracy. The need for standardized design always tending toward greater simplicity was advocated as the best way of decreasing inordinate tool and equipment investment.

W. A. Francis outlined the benefits of this policy in his talk on "What Part Can the Engineer Play in Helping to Reduce Repair Costs by Eliminating the Need for Costly Tools."

Predominating Factor in Sale of Car Today Is Appeal That Its Appearance Makes to Prospect

AN INTERVIEW WITH E. C. MORSE,
General Sales Manager of Wills Sainte Claire, Inc.

By D. M. McDonald,
Detroit News Representative of the Class Journal Co.

Detroit, Nov. 21.

CAR appearance is the predominating factor in the sale of any motor car today, the buying trend flowing naturally to the lines most successful in anticipating public desires, said E. C. Morse, general sales manager of Wills Sainte Claire, Inc., discussing peculiarities of the present market and the possible trends of buying in the coming year.

When a well-known manufacturer brings out a model which captures public fancy there is almost certain to be a run of business which carries all before it until equally well known competitors or a group of smaller competitors bring out models which divide public attention and share up the business.

In gathering up this business the manufacturer in whatever price class he may be not only dominates and takes the large share of the business in this price class, but also draws into it a large number of buyers from price classes either above or below the one in which he operates. This is just one of the elements of the present competitive era, Morse said.

Desire for style has tended to intensify the used car problem to a considerable extent, Morse declared, the average used car buyer of the preceding era of the business, now preferring to buy a new and the latest model in the low priced lines, to a model in the higher priced field which has come to be out of date. Used cars in the high priced lines probably suffer more from this than any other class, Morse said, because of the style appeal of the medium priced lines.

As a general rule, merchandising of used cars could be improved through selling them as cars of high intrinsic and transportation value whose former owners had traded them in solely because of style consideration, Morse stated. A very large part of the used car stocks of the country are simply cars that are not latest models but whose mechanical value is great, he said.

Too many people have come to be of the opinion that used cars are synonymous with broken down cars, whereas in most cases the cars are good mechanically. Dealers, by making the minor repairs necessary in most cases, are in a position to seek out buyers who are not primarily style buyers, and sell them transportation values which will make profits for themselves and result also in well satisfied customers.

Morse was of the opinion that the total volume of automobile buying in 1924 will be somewhat less than the buying for this year, basing his conclusions on the belief that a part of the large absorption of this year was due to undersold market conditions. In the coming year he sees the large normal replacement business with the additional business afforded by increased population and cumulative wealth but does not consider that there will be any undersold conditions to swell the sales totals.

With a somewhat reduced market and a greatly increased production capacity he is frankly skeptical of the possibilities of marketing all the cars that promise to be built. Manufacturers must make the most careful analyses of territories if they are not to find their dealers overloaded in spite of good normal business. With over-production all kinds of competitive practices may be indulged in with resultant injury to the integrity of individual makers and the industry generally.

Twyman Gets Plant for Rebuilding Cars

Acquires Old Lafayette Factory in Indianapolis—Two Makes to Be Handled

INDIANAPOLIS, Nov. 19—The Twyman Remanufacturing Motors Co. has been launched in Indianapolis by B. W. Twyman, former general manager of Nash Motors Co. in Milwaukee, and identified with the industry as a manufacturer, distributor and dealer for twenty years, to rebuild used cars. The company expects to start operations in January.

The former factory of the Lafayette Motors Co. at Indianapolis will be used as the first plant of the concern. It has 200,000 ft. of floor space and much land for expansion.

To Limit Scope at First

Two makes of cars will be remanufactured at first for dealers and owners within a radius of 350 miles of Indianapolis. No car will be accepted for remanufacture except those which require a complete chassis tear-down. Flat rate prices will be maintained for various types of Nash and Buick cars which will be the only ones handled at present. There also will be flat rates for cars that need refinish or new bodies of a different type and other alterations.

All cars accepted must be driveable. The company will send to trade-center cities for the cars, drive them to the plant and return them to their destination when rehabilitated. Flat rates will include this drive-to and the drive-away operation which is the basic plan, although wrecked cars may be shipped to the plant when desired.

A thorough test and an inspection will be given the rebuilt cars as they are received at the factory in the first place. In the tear-down every part and minor detail of the part will be inspected, and such parts as need renewal will be discarded and the new piece built into the assembly. Each vehicle that goes through this process will be given the re-manufacturing name-plate and will be covered with a guarantee identical with the new car standard warranty of the National Automobile Chamber of Commerce.

Will Save Dealers Overhead

The plant will do in a wholesale way what many dealers have attempted in their own establishments. Those dealers who can avail themselves of the new plan, and who have already signified their intention of availing themselves of it, say it will cut their service and rebuilding overhead materially.

Since July of this year Twyman has put all his time into an intensive study of dealer problems and especially the used car situation. He has made investigations in all parts of the country and has carried on experimental tear-down work to determine what use does to a car on the average, how much or how little of the car really wears out, and has studied costs of tear-down and rebuilding of various types of cars.

Some results of this tear-down investigation are surprising. For instance, he finds that of all the cars he has torn down (some of them with a record of 137,000 miles), but 10 per cent of the parts were badly worn or worn out.

Cars are discarded by owners quite generally now, he asserts, when but 29 per cent of the chassis consists of parts that really wear. In spite of this, the car is traded in, and in some cases sacrificed by the owner when remanufacturing would make it the equal of a new vehicle, he claims. In one type of steering gear investigated for wear it was found that only one small unit is subjected to real wear. This can be renewed for a cost of about 20 cents, exclusive of the tear-down and assembly of the unit.

ENGLAND MAY PLACE TARIFF ON TRUCKS

LONDON, Nov. 10 (by mail)—Seemingly inspired statements have appeared in the press which convey the impression that the Government practically has decided to impose an import duty upon foreign made tires and trucks. Agitation has been proceeding for a long time urging this form of protection for home industries.

The Minister of Labor in a speech this week pointed out that whereas the passenger car industry is relatively thriving under the protection of the 33 per cent import duty, the truck makers who have no such assistance are able to employ only a fraction of the labor their plants should absorb.

While the Minister did not assert that foreign trucks would be subject to a similar import duty, his words conveyed that impression.

Haynes Will Issue Bonds Aggregating $2,750,000

KOKOMO, IND., Nov. 19—The stockholders' meeting of the Haynes Automobile Co. at which 87 per cent of common stock was represented, voted to authorize a bond issue totaling $2,750,000. The plan includes the execution of first mortgage gold bonds of $1,750,000 to mature beginning May 1, 1929, at the rate of $160,000 annually until May, 1934, with the balance due May, 1939.

It is understood that another $1,000,000 of ten-year bonds will be taken by directors and others directly interested. Elwood Haynes, president of the company, says that a reorganization will result when the refinancing has been completed, and that it is expected that by the first of the year the concern will be operating on a paying basis.

Dorris Makes Start on Financing Plans

Offers to Buy Preferred Stock—Current Assets Far Above Current Liabilities

ST. LOUIS, Nov. 20—Stockholders of the Dorris Motor Car Co. took the first step in their plans to refinance the company at a meeting held last week at which an offer of $100,000 was made to H. B. Krenning, a director, for the purchase of his preferred stock.

It is expected that Krenning will give his decision on the offer at another meeting to be held Dec. 18. Although the refinancing of the company is expected to result in an increase in the capital, no announcement of the plans will be made public at this time.

J. F. Culver, secretary-treasurer and general manager of the company, said that the annual statement as of Oct. 31 shows gross assets of $1,060,498, and, after reserves of $198,254, net, fixed and current assets of $862,243.

The ratio of current assets to current liabilities is approximately eleven to one, Culver said, and the current liabilities consist of $25,000 owing to banks and $30,585 accounts payable.

Order Entered by Court to Sell Perfection Tire

FORT MADISON, IOWA, Nov. 21—Receivers for the defunct Perfection Tire & Rubber Co. have been granted permission by the Federal Court to sell the plant free of liens and incumbrances at the earliest possible date and then adjudicate the various claims.

P. S. Junkin and Charles C. Kennedy, the receivers, attempted this a year ago and sought an order to that effect, but litigation to block this move ensued, and it was not until this week that Judge Martin J. Wade entered the order as petitioned. The receivers indicated that the sale might be made Jan. 9, 1924, the plant to be sold either in its entirety or in parcels.

Priority of claims as fixed by Special Master Charles M. Dutcher was approved as follows: Claims of county, State and city for taxes due, mortgage held by the Nemours Trading Corp., amounting to nearly $1,000,000, and Government claims for documentary stamps used for excise taxes and the lien held by the Fire Protection company, which installed the sprinkler system in the plant. The court ruling, putting the Government claim as "general creditor," was an unusual one and involved nearly $31,000.

FORD WHEEL OUTPUT RECORD

DETROIT, Nov. 21—Production of wheels at the Hamilton, Ohio, plant of the Ford Motor Co. established a new high daily record on Oct. 26, when 9463 wheels were built.

Congress May Help Ford Shoals Plans

Congressman Madden Would Have Government Erect Substitute for Gorgas Plant

WASHINGTON, Nov. 20—Efforts of Henry Ford to purchase Muscle Shoals will be assisted by Congress immediately upon convening next month, under a bill to be introduced by Congressman Madden of Illinois.

Ford's offer included the Gorgas plant, which has been sold to the Alabama Power Co. under an option held by that company. Ford's announcement that he cannot use the site without the Gorgas plant would be met by the Government's construction of another 40,000 hp. plant, similar to the Gorgas plant, under the Madden bill.

The Gorgas plant was sold for $3,500,000 and a new power plant can be erected for that amount, Madden asserts. Madden proposes to introduce a bill empowering the Government to construct a new steam auxiliary power plant to replace the Gorgas plant.

The bill will authorize construction of the plant directly by the Government or its construction, under contract, by Ford or his company. It will also carry a provision authorizing the War Department to acquire, by condemnation or otherwise, a site for the steam power plant on the Black Warrior River near Lock No. 17.

An expenditure of between $50,000,000 and $60,000,000 will be necessary before the manufacture of fertilizer at the site can be begun, it is said, and Madden declares that, of the bidders for the site, only Ford is capable of carrying through the project successfully.

A. O. Smith Corp. Lists Equipment That It Needs

MILWAUKEE, Nov. 19—The A. O. Smith Corp., manufacturer of pressed steel frames, forgings and other products, has issued a list of forty-eight principal items of equipment it intends to purchase for additions to its works now nearing completion.

This is one of the largest lists of machinery requirements that has been offered to dealers in the mid-western market in several months.

Among the items needed are: One 400-ton hydraulic press and one rod straightening press; ten engine lathes; six milling machines; five planers; seven grinding machines; four horizontal boring mills; two slotters; two shapers; four radial drills; two sensitive drills, and four upright drilling machines.

CADILLAC SALES INCREASE

DETROIT, Nov. 21—In the first six weeks following the announcement of the new Cadillac V-63, an increase in sales of 44.8 per cent was recorded over the similar period following the announcement of its former model, the type 61. Production for the same period is also 42 per cent higher. The comparison is a clear index of increased demand, according to Lynn McNaughton, vice-president and general sales manager, because announcement of the models was at exactly the same season of the year with the same seasonal trends in effect.

FARMER SPENDS $65 YEAR IN OWNING CAR

WASHINGTON, Nov. 21—An important survey—the first of a series—showing the relation of the automobile to the American farmer and the expenses of a farmer's family, has been completed by the economists of the Department of Agriculture.

The first county selected as being typical was Livingston, New York, the survey showing that the average farmer's family expended in a year $2,012.

Automobiles were owned by 75.6 per cent of the families, and the cost of their operation and repair, classed under expenditures for "advancement," was $65 a year.

The purpose of the study, which will be extended to various parts of the country, is to determine whether farmers get "adequate returns in comfort, health and enjoyment from their expenditures."

Rauch & Lang Planning to Produce 100 Monthly

CHICOPEE FALLS, MASS., Nov. 21—Following a directors' conference of the Rauch & Lang Co. today it was stated that production would go forward at the rate of 100 cars and cabs a month. Formulation of the 1924 program, which looks toward expansion, will be completed shortly.

The company has produced 300 gasoline taxicabs this year, according to Paul A. Frank, president and treasurer. A system of time payments on cab sales direct from factory to consumer has been instituted, this applying to gasoline cabs only.

Court in Detroit Gives Decision to Wayne Tank

DETROIT, Nov. 19—Judge A. J. Tuttle of the United States District Court has decided in favor of the Wayne Tank & Pump Co. in the patent suit brought by the Permutit Co. of New York, involving the latter's patent on the zeolite water softening system.

The Permutit company declares that it will appeal this decision immediately. In addition to manufacturing gasoline tanks, the Wayne company makes both domestic and industrial water softening systems. Automobile laundries have found this valuable in washing cars.

Chicago Ford Plant Ready Early in 1924

Of Twenty-nine Assembly Units It Will Rank Next to That at Kearney

DETROIT, Nov. 19—The new Chicago assembly branch of Ford Motor Co. will be ready for production soon after the first of the year, machinery and conveyor equipment now being installed. The new plant will be the second largest of the twenty-nine Ford assembly units in the United States, being second only to Kearny, N. J. Capacity is for 600 cars in eight hours, the Kearny capacity being 700. The working force will be about 2500 men.

In addition to the regular branch assembly work, the Chicago plant is being equipped to build 250 closed car bodies in sixteen hours. This will include the making of upholstery and enameling. Latest type body ovens, heated by oil burners, are being installed. The plant has its own power house, separate from the main building and equipped with a steam turbo-generator of Ford manufacture.

Is Located on River

Being located on the Calumet River, navigable to large lake boats, it will be possible to ship direct to the plant from the Detroit manufacturing factories, and also is accessible by water connection with the Ford lumber mills in northern Michigan. Railroad facilities are also extensive. Freight cars can be run directly into the plant on either side, tracks within the building having capacity for fifty-six cars.

Interior layout represents the latest thought by Ford engineers in efficiency methods. No trucking will be necessary. Conveyor systems will cover the plant. There will be no wiring or shafting visible. Electric motors are applied directly to the machinery, and current is supplied by conduits concealed in the floor. The main assembly line runs down the center of the floor with feeder conveyors approaching it at right angles. These are to be used for the movement of stock from storage bins.

Details of Construction

The main building is 1360 ft. x 500 ft. It is one story high like all new Ford branches for economical handling of stock. Roof is of saw tooth construction. Of the eleven acres covered by the building there are eight of glass, principally in the roof of the plant. Administration offices and showrooms are located in the northeast corner. Supporting columns for the roof are 40 to 50 ft. apart. In the framework 5056 tons of steel were used.

Commenting on the completion of the building, the company declares it to be another big step in a tremendous expansion program which is of very large proportions.

Lelands Asking Data of Old Stockholders

Purpose of Questionnaire Not Known, but It May Be for Reimbursement

DETROIT, Nov. 20—A questionnaire has been sent out by Henry M. Leland and Wilfred C. Leland to stockholders of the Lincoln Motor Co., bought by Henry Ford for $8,000,000, requesting information on their purchase and sale of stock in the original company, which, since the receivership sale, has gone out of existence.

The letter from the Lelands contains blanks on which stockholders may state the number of shares purchased and the date on which they were acquired, from whom they were purchased, the date upon which they were sold, to whom and the price received. Information also is requested as to the number of shares still held, and it is requested that if the stockholders have disposed of their securities they should make this known, giving information covering all transactions.

The reason for sending out this questionnaire is a mystery. Some think that Henry Ford contemplates reimbursing stockholders to the extent of their original investment. The Lelands decline to make any statement, but say there is nothing immediate that is expected to result from it. By means of the questionnaire it is expected to check all shares of stock from the hands of the original purchasers to those of the present holders and to ascertain the amount of loss involved to each holder or former holder.

Whether stockholders are to be reimbursed, either now or ultimately, or that they have any reason to surmise they may, will not be discussed. It is common knowledge that the Lelands always have urged owners to hold their shares and that something would be done to provide for them at some future time. Whether the Lelands are working with Ford in getting the list of stock transactions will not be discussed, but it is generally believed here that the Lelands are acting entirely on their own initiative.

Report Shows Expenses of Victor Page Motors

STAMFORD, CONN., Nov. 20—The Stockholders Protective Committee of New England, after investigating the affairs of the Victor Page Motors Corp., has reported to stockholders of that organization through Adam V. Ferriere, chairman, as to what money was received and what became of it. In part the report says:

The figures determined at the last audit were given to the committee and showed that the corporation treasury had received from all sources $416,489 and of this amount $364,570 had been received from stock sales.

The books show that this money was expended as follows: Wages and salaries, $192,317; for overhead and expenses incidental to carrying on the business, such as rent, office supplies, telephone, light and power, office and engineering equipment, etc., $46,495; for plant, including real estate, sample cars, and machinery, $152,429; of obtaining patents, $8,014; advertising, $12,528.

Insurance accounted for, $2,136. Sundry and miscellaneous unimportant items account for the small difference between expenditures and receipts as given above.

WAGES PAID BY FORD DAZE HUGO STINNES

DETROIT, Nov. 20—Hugo Stinnes, son of Germany's greatest industrialist, spent most of today at the Ford plants in this city. He and his bride had luncheon with Henry and Edsel Ford and their aides at the Dearborn laboratories after inspecting the huge Highland Park factory in the morning. In the afternoon they went to River Rouge.

Young Stinnes was in more or less of a daze, not so much at what he saw as at what he heard. He couldn't comprehend a minimum wage of $6 a day with $10 for foremen and equal pay for women doing the same kind of work as men.

Pulcher Elected to Head Motor Truck Industries

DETROIT, Nov. 22—Officers elected at the annual meeting of Motor Truck Industries, Inc., were: Martin L. Pulcher, Federal Motor Truck Co., president; J. W. Stevenson, Indiana Motor Truck Co., vice-president; Fred Glover, Timken-Detroit Axle Co., second vice-president; A. S. Boulden, Selden Truck Corp., treasurer, and Don F. Whitaker, secretary and general manager.

Directors representing truck manufacturers elected were: C. J. Helm, Acme Motor Truck Co.; A. J. Banta, Clydesdale Motor Truck Co.; M. L. Pulcher, Federal; J. W. Stevenson, Indiana; O. W. Hayes, Republic Motor Truck Co.; A. S. Moré, Selden; Paul Moore, Service Motors, Inc.; T. R. Lippard, Stewart Motor Corp., and M. A. Holmes, Transport Truck Co.

Parts makers directors are: L. M. Viles, Buda Co.; G. W. Yeomans, Continental Motors Corp.; E. B. Ross, Clark Equipment Co.; C. A. Dana, Spicer Manufacturing Co.; Fred Glover, Timken, and A. E. Parsons, Brown-Lipe Gear Co.

The meeting was held in morning and afternoon sessions, the morning meeting being a general session. The afternoon was largely devoted to business at which the election and other business were taken up.

Vance New Manager of Studebaker Sales

Succeeds Harper, Who Has Taken Dealership—Was Formerly Export Manager

SOUTH BEND, IND., Nov. 21—Announcement is made by H. A. Biggs, vice-president and director of sales of the Studebaker Corp., of the appointment of H. S. Vance as sales manager to succeed Harry B. Harper, who has taken the Studebaker dealership in Philadelphia.

For the last year and a half Vance has been manager of export sales for Studebaker and has been in the organization for the last twelve years in various executive positions in the manufacturing, financial and sales departments.

Harper Handles Studebaker

PHILADELPHIA, Nov. 21—H. B. Harper, who recently retired as sales manager of the Studebaker Corp. of America, has purchased the capital stock of the Studebaker Sales Co., Studebaker dealer in this city. He has become president of the company, which controls Philadelphia and some outlying territory, with about 50 associate dealers.

The Philadelphia business during the current year will amount to about $6,000,000, which makes the purchase by Harper one of the biggest dealer transactions in the industry in several years.

When Harper resigned his office at the Studebaker headquarters at South Bend, Ind., the officers of the company issued a statement saying that he had performed valuable service and had fitted harmoniously into the general organization. The statement seems to be borne out by the fact that Harper, in selecting a dealership, as he intimated he was going to do when he resigned, picked a Studebaker dealership.

Before he joined Studebaker headquarters Harper was president of the Overland-Harper Co., Overland and Willys-Knight distributor in a territory centered at Philadelphia.

Olds Planning to Build 5000 Cars in December

DETROIT, Nov. 21—Olds Motors Works is working toward a production of 5000 cars in December, 6500 in January and 8000 in February. Owing to changes that are being made in equipment at the factory and the general rearrangement of plant facilities, production has been held low, November showing daily averages of about 145.

It is expected to have the work of organizing plant manufacturing facilities completed by the opening of the heavy spring manufacturing period. Orders for new models have run far ahead of the company's ability to produce with the factory changes under way. By spring production is expected to reach four times the present totals.

Parts Makers Swing Back to Spring Pace

Sales Reported by Members of M. A. M. A. Totaled $53,803,350 in October

NEW YORK, Nov. 20—An increase of 16.5 per cent in sales during October as compared with September is shown in the reports filed by members of the Motor and Accessory Manufacturers Association. This makes October the best month of the year since June, which marked the end of a four-month stretch of remarkable business, when all sales records for this branch of the industry were broken.

October sales reached a total of $53,803,350, in comparison with $46,222,650 in September, which was a big jump following a slump of 3.90 per cent in September over August. In October, 1922, the sales total was $39,753,000, which was considered an extraordinarily high mark at that time.

This increase in sales is only one indication of the business now being enjoyed by the parts makers. All report busy factories, and so far in November orders have been coming in at a rate that makes it look as if November would be even a better month than its predecessor.

In keeping with this sales activity, the credit departments of the members of the association report collections excellent, and in proof of this October's past-due notes show a decrease of 20 per cent from September, with a total of $2,857,450, as compared with $3,583,000.

Notes outstanding show a big improvement, this total being $1,094,500, as compared with $1,322,550.

Conservatism in Future Orders

MILWAUKEE, Nov. 20—While some concerns engaged in the manufacture of automotive units, parts and equipment are working at heavier capacity than a month ago, others are experiencing the usual let-down in activity as the year comes to a close. Reports from leading firms in all lines indicate a good volume of sales, but conservatism in future orders.

The monthly business summary issued by the largest Milwaukee bank, discussing the period from Oct. 1 to Nov. 1, says:

Returns from 48 typical firms in Milwaukee county employing more than 500 each show a net increase in the number employed at the end of October of 0.2 per cent. A considerable decrease in automobiles, parts and accessories was slightly more than offset by increases in food products, leather and shoes.

Metal products and textiles showed negligible decreases and may be considered as having remained practically stationary compared with September. . . . In iron, steel and machinery business was a little more active. A firm manufacturing gas engines showed a substantial increase in sales and unfilled orders.

A steel foundry operated at full capacity; another at 74 per cent, against 66 per cent in September. Machine tools were a shade better. Makers of electrical equipment are busy. Automobile parts and equipment shops show some letting down which is in large measure seasonal. A tire concern reports a higher percentage of operation.

OCTOBER SALES OF M. A. A. M. MEMBERS INCREASED 16.5 PER CENT OVER SEPTEMBER

NEW YORK, Nov. 20—Reports from members of the Motor and Accessory Manufacturers Association show that sales in October increased 16.5 per cent over September. Total sales amounted to $53,803,350 as compared with $46,222,650 in September. Past due accounts showed a decrease of 20 per cent.

The following table shows the sales by members of the association, the total past due accounts and notes held for all of 1922 and the first ten months of 1923:

1922	Total Sales	Per Cent Change	Total Past Due	Per Cent Change	Total Notes Outstanding	Per Cent Change
January...	$17,320,000	20.61 Inc.	$4,450,000	5.45 Inc.	$3,146,000	7.02 Dec.
February..	22,720,000	31,17 Inc.	4,070,000	8.57 Dec.	3,483,000	10.74 Inc.
March	28,670,000	26.14 Inc.	2,890,000	28.86 Dec.	2,657,000	23.69 Dec.
April	33,830,000	18.70 Inc.	3,000,000	2.00 Inc.	2,500,000	1.05 Dec.
May	43,700,000	28.06 Inc.	2,900,000	2.75 Dec.	2,450,000	6.05 Dec.
June	42,000,000	3.85 Dec.	2,840,000	1.25 Dec.	2,320,000	5.00 Dec.
July	41,001,670	2.42 Dec.	3,423,850	20.42 Inc.	2,217,670	4.49 Dec.
August	43,700,000	5.00 Inc.	3,705,000	8.21 Inc.	2,398,350	8.15 Inc.
September.	37,300,050	13.36 Dec.	4,220,400	13.91 Inc.	2,658,800	10.86 Inc.
October ..	39,753,800	3.90 Inc.	3,463,850	17.93 Dec.	2,603,100	2.09 Dec.
November..	36,616,850	5.51 Dec.	4,245,850	22.58 Inc.	2,442,700	6.15 Dec.
December..	34,711,630	5.20 Dec.	3,494,850	17.69 Dec.	1,905,650	21.98 Dec.
1923						
January ..	45,451,950	30.94 Inc.	2,469,950	29.33 Dec.	1,945,850	2.11 Inc.
February..	48,518,700	6.75 Inc.	2,741,100	10.82 Inc.	1,981,950	1.86 Inc.
March	59,428,800	22.49 Inc.	2,129,350	22.32 Dec.	1,929,300	2.66 Dec.
April	61,647,050	4.00 Inc.	3,313,150	8.05 Inc.	1,839,350	5.00 Dec.
May	58,409,550	5.25 Dec.	1,982,750	14.28 Dec.	1,140,150	38.00 Dec.
June	58,067,500	.059 Dec.	2,191,150	10.55 Inc.	1,111,970	2.47 Inc.
July	48,536,700	16.40 Dec.	2,313,400	5.60 Inc.	1,424,450	28.10 Inc.
August.....	50,264,100	3.50 Inc.	2,382,370	7.00 Inc.	1,132,250	20.00 Dec.
September.	46,222,650	8.04 Dec.	3,583,000	50.39 Inc.	1,322,550	16.80 Inc.
October ..	53,803,350	16.50 Inc.	2,857,450	20.00 Dec.	1,094,500	17.00 Dec.

400 Stars and 45 Flints Now Being Built Daily

NEW YORK, Nov. 20—Having cleaned up on inventory and successfully introduced a new model of the Star, Durant Motors, Inc., has stepped up production until now the daily mark is 40 per cent better than in October. Stars are coming through at the rate of 400 a day, while the daily quota of the Durant is about 150. Flints are being made both at Flint and Long Island City at the rate of from forty-five to fifty a day.

The debut of the Princeton, which is to be manufactured in the Locomobile plant at Bridgeport, Conn., has been delayed. It will not be ready for the New York show as expected, but every effort will be made to have it ready for inspection soon after the first of the year.

FORD INSTALLING GENERATORS

DETROIT, Nov. 21—Construction of the first of eight new 62,500 hp. turbogenerators to be installed in the Ford power house at River Rouge is 85 per cent completed. The test run is scheduled for January. The second unit is 15 per cent under way. With all units now planned in place, River Rouge plant will be capable of producing one-half million horsepower.

Congress Delegates Will See Truck Uses

NEW YORK, Nov. 20—Plans are maturing under the direction of George Bauer, secretary of the Foreign Trade committee of the National Automobile Chamber of Commerce for an automotive vocational tour for delegates to the world motor transport congress which the N. A. C. C. is promoting. The congress will be held in Detroit next May, and it is proposed to run the tour from that city to Washington.

The vocational tour is the idea of Jay P. Rathbun of the White Co., and a member of the Foreign Trade committee. He believes that such a tour would furnish the delegates with ideas on the numerous vocational uses to which the motor vehicle may be put and enable them to secure authoritative data on distribution systems used by department stores, dairy establishments, municipal departments and other major economic enterprises.

Data obtained from these first-hand investigations will be devoid of bias and consequently can be used most effectively by the delegates in advocating new uses of motor vehicles in the local enterprises of their native countries.

The tour will be so arranged that stops may be made at big plants and commercial enterprises employing automobile fleets, and the foreign delegates will be given every opportunity to learn for themselves just how effectively Americans are making use of motor transport to improve the efficiency of their establishments.

Uniform Title Law Wanted by Motorists

At Annual Convention They Also Plan to Survey Truck Overloading

WASHINGTON, Nov. 21—Nine resolutions, several of which referred to the construction of specific highways, were adopted at the annual meeting of the National Motorists Association held in this city. Chief among them were the following:

A committee of five to be named from the association to make a survey of remedial and constructive measures to eliminate the overloading of commercial vehicles, on the ground that it destroys highways.

The adoption of a uniform or approved motor vehicle title law.

The curbing of efforts to place additional burdens on motorists through increased taxation.

The convention was attended by representatives of 347 affiliated clubs in thirty-seven states, having a membership of 450,000.

Call Made on President

A call was made on President Coolidge at the White House incident to the convention, when the President paid tribute to the automobile as an educator whose future was insolubly linked with highway development. He stressed the importance of reasonable rules and regulations for providing greater safety and also stated his willingness to cooperate in bringing about an equitable method of taxation.

Richard H. Lee, president of the New York Automobile Club, was placed at the head of a special committee to conduct a nation-wide survey of the grade crossing hazard with a view to preparing a constructive program.

In commenting on the grade crossing situation, Judge Lee stated that at the present progress made on the elimination of grade crossings, it would require 150 years to complete the work, whereas it should be possible to do it in ten years without any undue hardships on the railroads.

Model Law to Be Drafted

His committee will seek the cooperation of the railroads, and the survey, made probably first in the State of New York, will cover all existing laws. According to Lee, the committee, working with the New York Committee, will draft a model grade crossing law for adoption by all the States.

The officers of the association elected for the new year follow:

Judge Walter D. Meals of Cleveland, president; Judge Richard H. Lee of New York; first vice-president; C. H. Hageman, Kansas City, second vice-president; Eugene Stuart, Louisville, third vice-president; J. B. Weeks, Philadelphia, fourth vice-president; E. C. Biesi, Dallas, fifth vice-president; H. M. Lucius, Baltimore, treasurer, and Fred H. Caley, Cleveland, Secretary. All of the officers were re-elected except C. H. Verschoyle, third vice-president, Dallas, who resigned.

New directors elected were:

H. S. Cohen, Dallas; Victor Pettrio, Milwaukee; S. H. Cromwell, Kansas City; George McIninch, St. Joseph; Frank Smith, Rochester; John Bridges, Baltimore; Charles C. Guyer, Wilmington; O. A. Ahlgren, Whiting, Ind.; Fred H. Caley; C. N. Roth, Pittsburgh; M. J. McCormick, Toledo; Edward F. Brashears, Washington, and E. C. Milner, Atlanta, Ga.

Kansas City was selected as the place of meeting in 1924.

Dura Expands Capacity and Adds to Personnel

TOLEDO, Nov. 19—Plant facilities of the Dura Co., maker of automobile window regulators and closed car fittings, have been doubled through the acquisition of two additional factory buildings. This adds more than 50,000 sq. ft. of factory floor space to Plant No. 2. The present employment roll of 450 workers will be increased about 33 per cent.

In line with these expansion plans, the company has made a number of additions to the executive, manufacturing and engineering personnel. F. J. Broad, recently sales manager of the Shepard Art Metal Co., has been made manager of the fittings division; H. W. Wilson is the experimental engineer in charge of the fittings department; H. P. Hibbard, formerly tool and die engineer of the Willys-Overland Co., is factory manager, and Roger S. Woodhull, formerly an executive of the Milburn Wagon Co., is in charge of sales and advertising.

Company Is Organized to Make Vacuum Piston

NEWARK, N. J., Nov. 17—The Hold-Mar Vacuum Piston Co., Inc., has been organized in this city to manufacture so-called vacuum pistons for gasoline engines. A flat cylindrical steel chamber is made, from which some of the air is driven by heating, whereupon the chamber is sealed and is then ready for insertion in the mold for a piston casting.

The plant of the concern is located at 437 New Jersey Railroad Avenue, and an office has been opened in the Chamber of Commerce Building. W. E. Holder is president; Martin Bender, vice-president; D. Crecca, secretary, and Fred A. Close, treasurer. W. E. Holder is general manager, and Martin Bender, factory superintendent.

The company plans to manufacture vacuum chambers, piston castings and semi-finished and finished pistons for all internal combustion engines under the trade names of the Hold-Mar vacuum chamber and the Hold-Mar vacuum piston.

CORRECTION

Budd G. Nice of the Nice Ball Bearing Co. of Philadelphia is not a director of the Fox Motor Car Co. as stated in AUTOMOTIVE INDUSTRIES, Nov. 8, having resigned from the board in November, 1922.

Stocking for Spring Optional with Dealer

Manufacturers Will Urge, but Not Force, Him to Accumulate Stocks of Cars

DETROIT, Nov. 19 — Stocking for the expected rush of spring orders will be entirely optional with dealers, according to the plans of leading manufacturers. The advisability of stocking, of course, will be urged upon dealers, with the spring shortage of the present year held out as an example of what happens when foresight is lacking. Nothing beyond this is expected to be required.

Every means is being taken by manufacturers to impress upon dealers the practical certainty of another heavy buying movement in the spring, a movement which will be in excess of current capacity of factories. Without reasonable stocks, dealers will not be able to get all cars they require from current production, the experience this year being that only a small percentage of such requirements were met.

Experience Being Pointed Out

Loss of this business at the best time of the year is pointed out to dealers as the main reason why their earnings were far lower than factory prosperity would seem to indicate. By being able to take advantage of proffered business in the spring, dealers make their success for the year practically certain, it is pointed out, whereas if they are unable to make deliveries, that part of the year's business that means large profits is lost.

Some factories will store a number of cars at their plants or at branches about the country, but the number that will be stored in this way will be small and will not represent more than a few good days of heavy production.

If there is adequate stocking to be done it can only be done by dealers because excess factory and branch space for storage is very limited. A number of factories which stored cars last year will be unable to do it this year because all factory space is now in use and experience with storage in warehouses or outside buildings has been disappointing.

Dealers Paid for Storage

Special arrangements are being made by some manufacturers to aid dealers in carrying cars, stored. One factory is allowing dealers ten cents a day for every day that a car is stored over thirty days. Dealers who are unable to finance car stocks through their local bankers will be assisted by the factories through finance company connections. In addition prices are being guaranteed to protect dealers during the months that they may have stocks on hand.

In advising dealers on car storage for spring, factories as a rule are taking

(Continued on next page)

Displays to Be Made in Gallery of Armory

Eleventh Hour Applications Filed for Space at National Show in New York

NEW YORK, Nov. 19—When the National Automobile Chamber of Commerce took over the Bronx Armory for show purposes it was thought that with 180,000 sq. ft. of floor space available it would be possible to put the complete show on one floor and not crowd anyone. Eleventh-hour applications, however, have caused General Manager S. A. Miles to revise his plans so as to include a section of the balcony in the show picture.

A section of the north side of the gallery, therefore, has been allotted to the late-comers in the accessory division, and to date fifty-five of them have been given space there. Nearly 300 of the accessory displays, however, will be on the main floor along with the car displays, so that technically the show next January will be a one-floor display, something the industry has not enjoyed since the early days at Madison Square Garden.

This action on the part of the committee will not reduce noticeably the space reserved for visitors who desire to rest and look at the show from above. There still remain in the south gallery alone 1600 seats, divided by the band stand. Wide walks at both the east and west ends connect the north and south galleries, so that exhibitors in the newly opened section will be in close contact with the show crowds.

Searchlight to Guide Visitors

NEW YORK, Nov. 20—Realizing that the radical action in moving the New York show from Grand Central Palace to the Bronx armory may have aroused fear among exhibitors that the crowds will not go to 196th Street to attend the national exhibition, General Manager S. A. Miles has planned an educational campaign.

In demonstrating the accessibility of the Armory, Miles will place a searchlight, said to be one of the largest in the world, on the roof of the Armory, with the beams pointing directly up. This will make a tower of light which will guide motorists.

Banners on Concourse

In addition, banners will be placed on many corners of the Concourse. Arrows will mark all motor routes to the Armory, while those persons who drive will find a parking space 800 x 1000 at the Armory.

Those depending on other means of transportation will discover that Miles has taken every precaution to make it easy to get to the show. Crosstown cars will carry signs reading "This Car to the Auto Show," while patrons of the subway will not have to fear getting off the route.

To advertise the show, Miles will send formal invitations to 35,000 dealers. There will be 5000 posters and window cards hung in New York; there will be signs on subway and elevated platforms and on the buses; department store windows, as well as hotel lobbies, will be plastered with advertising literature, while even the menus of the hotels and restaurants will carry show advertisements.

Stocking for Spring Optional with Dealer

(*Continued from preceding page*)

dealers into their confidence on plans for the coming year. This has been found necessary because of dealer anxiety regarding new models, price changes and other questions which influence plans on stocking. Dealers will not take chances on storing cars which may be superseded by new models within a short time or on which lower prices may become effective.

Used cars will have a part in determining the extent to which individual dealers will store cars for spring. In many cities used car stocks are higher than they have been at other similar seasons and are moving with more difficulty. Dealers who are forced to carry such stocks will not be able financially to stock as many new cars as they might wish. A clean-up on used cars by taking losses will make it possible to store more new cars than otherwise would be possible.

In back of the general spring storage proposition lies the question in the dealer's mind as to whether business will be as good as in the last two early periods. Every effort is being made by manufacturers to build up dealer confidence on this point. Manufacturers themselves are fully convinced that it will be easily as good if not better than in the past two years. Doubt on the general business situation is ascribed mostly to the presidential year complex.

In low priced lines manufacturers are building their spring trade now through part payment plans. Dealers are lining up a large volume of business in this way which will influence them in their storing plans.

Insurance Policyholders Must Aid in Liquidation

MILWAUKEE, Nov. 19—Eighteen thousand policyholders in the Automobile Liability Insurance Co., Ltd., Milwaukee, have been called upon to pay an assessment aggregating $197,000 to be used in liquidating claims totaling nearly $400,000, by an order of the Milwaukee circuit court.

The mutual's affairs were taken over by the Wisconsin insurance commission on March 15, 1922, after it encountered financial difficulties, said to be due to its acceptance of jitney bus and taxicab company risks, which drained its assets. Sales of assets brought in a sum sufficient to pay only one-half of claims, and the assessment has been ordered under the terms of the policy.

N.A.D.A. Will Hold Meetings at Shows

One Is Scheduled for New York on January 10 and Another for Chicago

NEW YORK, Nov. 19—The National Automobile Dealers Association will hold meetings during both the New York and Chicago shows, the former being scheduled for Jan. 10 at Hotel Commodore. The exact date of the Chicago meeting has not been announced.

Speakers and subjects for the New York meeting are as follows:

"The Outlook for 1924," C. A. Vane, general manager of the N. A. D. A.

"Five Per-Cent Net Profits," C. E. Gambill, president of the Gambill Motor Car Co., Chicago.

"Service, the Greatest New Car Selling Asset," Percy E. Chamberlain.

"Salesmen Who Know How to Get the Money," J. S. Knox.

"Obligations of an Automobile Dealer," F. W. A. Vesper, president of the Vesper-Buick Co., St. Louis.

For several years the annual meeting of the association has been held in Chicago, but in the last two years there has been a gradual division of dealer attendance at both the New York and Chicago shows and at present only about half of the dealer body attends either show. By staging meetings in both cities it is expected to get full representation for the discussion of dealer problems and the mapping out of the 1924 program.

Sales Activity in Peru Showing No Abatement

LIMA, PERU, Nov. 1 (*by mail*)—The automotive activity that has been on the increase in Peru every month since January, 1923, has shown no abatement, especially since July 1. Automobiles, trucks and accessories have entered Peru under lower duties since that date and this has permitted the dealers to offer new model cars to the public at before-the-war prices.

Local stocks of many makes of automobiles of popular demand are being sold out as fast as imported. What is more important than immediate sales, however, is the future market. This promises to be good, because of an awakening interest in highways. From every part of Peru—from Piura, Chiclayo, Trujillo and Ice on the coast, and from the cities on the plateau of the Andes, Huancayo, Ayacucho and Cuzco—a growing demand for highway construction is being reflected in the press.

Exchange, unfortunately, became a little weaker during the latter part of October but so far it has fallen only a cent or two below $4 to the pound (Peruvian). Bank clearings and the total imports and exports are running ahead of the corresponding months of last year.

Men of the Industry and What They Are Doing

Mooney Returning This Month

J. D. Mooney, vice-president of the General Motors Corp. and president of the General Motors Export Co., will return to New York after a five months trip about Nov. 30, advices having reached the offices of these companies here that he would sail from England on the S. S. Aquitania on Nov. 24. During his trip, Mooney visited Australia, New Zealand and various parts of the Far East and Europe.

Firestone Products Advances Baker

William A. Baker, who has been in charge of the Detroit offices of the Firestone Steel Products Co., has been appointed general sales manager of the company and will remove to Akron to take up his new duties.

Paul S. Smith Joins Duratex

Paul S. Smith has joined the Duratex Corp., Newark, N. J., as chemical engineer in charge of development work. Smith was graduated from Harvard University in the class of 1902, receiving an A. M. in chemistry the following year. After a year at the United States Naval Torpedo Station he spent three years in the manufacture of smokeless powder, solvents and lacquers, followed by three years as chemist of the Fabrikoid Co. Prior to his connection with Duratex, Smith served for ten years as chemist and chemical engineer for the O'Bannon Corp.

Chain Belt Appoints Sullivan

Allen C. Sullivan, formerly with the Smith & Watson Iron Works of Portland, Ore., as chief engineer, has been placed in charge of the Northwest Territory, with headquarters in Portland, by the Chain Belt Co., which has established direct factory branches in Portland and Seattle. Don B. Catton, formerly with the Meese & Gottfried Co., will be special sales representative for the Portland office. W. F. Nichols, also from the Meese & Gottfried Co., will handle the Seattle and British Columbia territory.

Berg in New Connection

Roy E. Berg, formerly with the Columbia Carbureter Co., Chicago, has joined the sales department of the United Manufacturing & Distributing Co. of Chicago, manufacturer of the United Air Cleaner for automobile engines.

Wiman Manages Union Malleable

Charles Deere Wiman, great grandson of John Deere, founder of the implement and factory industries bearing his name, has been made general manager of the Union Malleable plant of Deere & Co. Elmer A. Gullberg, whom he succeeds and who has been connected with the company for fourteen years, now becomes general superintendent. Gullberg succeeded J. L. Simmon, now general manager of the Dayton Malleable Iron Co. George P. Pearce, Union Malleable engineer three years, has resigned to join Simmon. Morley Thomas, assistant superintendent and an employee at the Union plant for ten years, has also gone to Dayton.

Changes with Service Motors

Sale of the railroad motor coach division of Service Motors, Inc., to the J. G. Brill Co. of Philadelphia has resulted in several changes among the executives of Service Motors. Charles Guernsey, vice-president and general manager of the division, just sold, has joined the Brill forces in a similar capacity. John D. Ristine, sales manager under Guernsey, has become assistant to the vice-president of the Nason Coal Co. of Chicago. A. F. McCormick, A. H. Hudson, R. L. Spragle, J. M. Randall, A. J. Peters and Vaughn W. Oswalt are other Service company men who have joined the Brill company.

Wheeler Sales Engineer for Ramsey

D. I. Wheeler has resigned as manager of the Cleveland office of the Morse Chain Co. of Ithaca, N. Y., to become sales engineer of the Ramsey Chain Co., Inc., of Albany, N. Y., which has developed and patented the Ramsey compensating joint silent chain. Wheeler will make his headquarters in Albany, and arrangements have been made to open branch offices in the larger centers.

Rohde Manages Torrington

O. J. Rohde, recently resigned as general manager of the Wire Wheel Corp. of America, has become general manager of the Torrington Co., part of the parent company controlling the Wire Wheel Corporation.

Burke Succeeds Mehan

Joseph J. Burke, who has represented the Brunner Manufacturing Co. in the New York territory, has been appointed sales manager, succeeding J. H. Mehan. Mehan resigned to become manager of the Research Club, an organization of non-competing jobbers in various parts of the country with headquarters in Chicago.

Emerson Now with Yellow Cab

P. L. Emerson, formerly sales manager of the Olds Motor Works and assistant sales manager of the Reo Motor Car Co., has joined the forces of the Yellow Cab Manufacturing Co. He will assist Walter Hambly, who recently came from the Mack organization to become sales manager of the truck division, and H. C. Bradfield, director of sales and advertising of the Yellow organization.

Bankers Entertained at Studebaker Plant

Erskine Tells Them Many Makers Believe Output Peak Is Yet to Come

SOUTH BEND, IND., Nov. 19—Sixty-five bankers who visited the plant of the Studebaker Corp., principally to study the workings of the Industrial Finance Corp. of New York, which acts as banker to Studebaker dealers in the financing of deferred payment sales of cars, were told by President Erskine that more nonsense is written about the saturation point than on almost any other subject related to the automobile industry. In his opinion, curtailment cures overproduction in the automobile industry as it does in every other.

Speaking to the bankers at a dinner at the Hotel Oliver, Erskine declared that many manufacturers believe the peak is yet to be reached, and that within a short time there will be manufacturing capacity for at least 4,250,000, possibly 4,500,000 annually. Continuing, he said:

Competition Lies Ahead

Obviously a considerable degree of competition lies ahead of us. It is important, however, to realize what competition means in the automobile industry. Most commentators think of it as competition strictly on a price basis. That is, they assume that automobiles are sold like any staple product such as grain, cotton, wool, rubber or other commodities. But the cases are quite different.

An automobile is not marketed as a staple. It has a style appeal, an appeal through line, color or other distinctive feature. In marketing an automobile one gets into the realm of proprietary things. Price is just one of several elements in its appeal to the consumer. I can conceive of a situation when the most extreme conditions of competition might prevail and yet certain well handled companies might go through such a period with the largest earnings in their history.

Autocar Will Increase Prices of Some Models

ARDMORE, PA., Nov. 19—Effective Dec. 15 the Autocar Co. will advance the prices of its 2 to 3-ton and 4 to 6-ton chassis, the increases ranging from $350 to $500. Both models on the 1½-2-ton chassis will remain unchanged and continue to list at $2,200 and $2,300, respectively.

The following shows the present and new prices:

	OLD	NEW
Model H, 2 to 3-ton	$3,100	$3,450
Model K, 2 to 3-ton	3,200	3,550
Model M, 4 to 6-ton	4,200	4,650
Model L, 4 to 6-ton	4,300	4,800

Underwriters List 4-Wheel Brake Cars

Nine So Equipped Given Recognition by National Liberty Insurance Co.

NEW YORK, Nov. 20—Nine different makes of motor vehicles equipped with four-wheel brakes now are recognized by the National Liberty Insurance Co., which allows a discount from manual collision and property damage on cars so equipped. This list includes the Rickenbacker six, Packard eight, Buick four, Buick six, Duesenberg eight, Oakland six, Cadillac eight, Chalmers six, Marmon six and the Bethlehem Air Line one-ton truck, all of 1924 type. Of these, Marmon and Chalmers make four-wheel brakes optional.

Where equipment with four-wheel brakes is optional, the company requires the attachment of a warranty providing as follows:

"In consideration of a reduction in premium, it is warranted by the assured that the automobile insured under this policy is equipped with four-wheel brakes; and the assured undertakes during the currency of this policy to use all diligence and care in maintaining the efficiency of said brakes."

McFarlan and Anderson Carry 4-Wheel Brakes

ROCK HILL, S. C., Nov. 19—The Anderson Motor Co. has announced that the 1924 models of its "41" and "50" chassis may be equipped optionally with four-wheel brakes and balloon tires at an extra cost of $75 and $110 respectively. The four-wheel brakes are mechanically operated and are of the external contracting type. The balloon tires are 32 x 6, the regular size being 32 x 4 in.

CONNERSVILLE, IND., Nov. 19—The McFarlan Motor Corp. has adopted four-wheel brakes as optional equipment on all models at an increase of $150 above the regular list.

New 2½-Ton Truck Made by American-La France

NEW YORK, Nov. 19—A new 2½-ton model has been brought out by the American-La France Fire Engine Co., Inc., and is featured by a brake designed on the plan of a disk clutch, with special cooling facilities. Four disks fitted with brake lining take the place of the usual drum on the propeller shaft, and it is claimed that, by reason of their construction, it is possible to make lining replacements in a very short time.

The brake disks incorporate an air impeller, which by its rotation with the shaft serves to cool the brake.

Other features include a choice of double reduction or worm drive, both axles being made at the factory. The new model is listed at $3,950, f.o.b., Bloomfield, N. J., or Elmira, N. Y. The chassis weighs 6600 lb. and is equipped with a 4¼ by 6 in. engine. With the exception of the brake, the new model resembles the larger sizes now in full production.

13 *MAKERS CONTRACT FOR 4-WHEEL BRAKES*

DETROIT, Nov. 19—Manufacturers of thirteen lines of cars are now under contract with the Four Wheel Hydraulic Brake Corp., manufacturer of Lockheed brakes, for the installation of these brakes on their cars.

Announcement of these lines will be made by the individual car manufacturers between now and the New York national show. Included in the list are producers of four, six and eight-cylinder cars, and in all price classes.

The total output of the manufacturers who have announced Lockheed brake equipment, or will announce it, will approximate 250,000 cars in 1924, according to early production estimates.

Duesenberg Is Equipped with Balloon Type Tire

INDIANAPOLIS, Nov. 21—The Duesenberg Straight Eight is now equipped with balloon tires as optional equipment, a charge of $150 being added when so fitted.

Experiments were made under all kinds of conditions during the last three months, and as a result it was found that higher average speeds could be maintained over poor roads than with the standard smaller tire equipment.

The pressure used in the tire ranges from 27 to 30 lb. Speeds up to 75 m.p.h. were attained during the tests.

Jordan Builds Victoria as Part of Closed Line

CLEVELAND, Nov. 20—The Jordan Motor Car Co. has added a four-passenger victoria to its line of closed models. The rear seat accommodates two people comfortably, and the seat beside the driver is a folding type.

The upholstery is of Windsor Weave material, selected to harmonize with the body colors, which are optional Crane-Simplex gray or Jordan dark blue.

The victoria is mounted on the 120 in. wheelbase chassis and has full equipment, including trunk, automatic windshield wiper and mirror. It lists at $2,285.

NO PEERLESS MAXWELL MERGER

NEW YORK, Nov. 21—Rumors in the financial district of a possible merger of the Peerless and Maxwell companies are positively denied by executives of both companies.

Graham Occupying Additional Plants

Takes Over Former King Factory and Also One That Was Built by Denby

DETROIT, Nov. 21—Graham Brothers has taken over the former plant of the King Motor Car Co., which has moved to Buffalo, and the plant built by the Denby Motor Truck Co., but never occupied, and now is manufacturing trucks in the new location.

The new plants give Graham about three times the manufacturing space it formerly occupied, and because of their proximity to the Dodge Brothers plant will save time and effect economy in the handling of materials.

The former King plant will be given over to truck chassis assembly, and the former Denby plant will be used as a paint shop and for storage. The Evansville, Ind., plant of the Graham company, at which truck bodies are built and which also serves as a distributing point for trucks in that territory, is not affected by the Detroit changes, other than that the new plant here relieves pressure.

The extent to which capacity will be increased by the additional space has not been determined, but the company reports large increases in business due to its new models, and declares all manufacturing resources will be required to meet the demand. The company is working toward an annual output of approximately 50,000 vehicles, the recent changes forming part of an extensive expansion program. In 1924 the output will be approximately 20,000, it is stated.

Decelerometer Shown Brake Lining Makers

WASHINGTON, Nov. 21—At a meeting of the Asbestos Brake Lining Association, held at the Bureau of Standards today, various developments in the testing of brakes and brake linings were explained by W. S. James and S. von Amon of the Bureau staff.

James described the decelerometers designed and built at the Bureau for determining the effectiveness of brakes and showed in operation an indicating type just completed, as well as a recording instrument which has been in use for several months. Various records made with this decelerometer were shown.

Von Amon presented details of modifications recently made in the machine for testing brake linings, and exhibited the machine in operation. It was stated that the durability of brake linings has been improved very greatly already as a direct result of the general use of lining testing machines developed at the Bureau.

It was announced that the next regular meeting of the association will be held at the Hotel McAlpin, New York, on Dec. 12.

Citroen Bases Plant Talk on Trip to U. S.

Aims to Reduce Cost of Production to Bring in New Classes of Buyers

PARIS, Nov. 10 (*by mail*)—How to increase production was the leading thought in a speech by André Citroen at the close of a banquet uniting about 500 heads of supply firms, his leading engineers, American production experts now laying down new plant and machinery, and a delegation of workers from the Citroen factory.

"Output at the present time is 140 cars per day, but in order to catch up with demand this must be increased to 200 per day before March 1, 1924, and the probabilities are that even then demand will have outrun us," declared Citroen. "In 1922 the number of Citroen cars exported was about 4000, this was increased to 8000 in 1923, and orders in hand for 1924 exceed 16,000. The value of these exports was 100,000,000 francs last year and will be double this amount next year."

Will Open Engineering School

Other points brought out by Citroen in his speech were his intention to establish a school of applied engineering for the automobile industry, the possibility of broadening the market by reducing cost of production, the remoteness of a saturation point, and the relationships which should exist between supply firms and the factory. The gathering, which is the first of its kind ever held in France, was presided over by Gaston Vidal, Under-Secretary of State for Technical Education.

In Paris, as elsewhere, it has been the practice during the show period to unite factory heads and dealers from various parts of the country. The problem at the present time is not sales, but production, and it was with the object of laying out his program and soliciting their cooperation that Citroen invited the heads of his supply firms to meet him. It is believed that gatherings on these lines, probably of a rather more technical character, will be held at regular intervals.

Cites United States Example

André Citroen put forth the example of the United States, where the number of cars had increased from 1,250,000 to 15,000,000 in a period of ten years, as proof that immense growth was possible in France, on condition that modern methods were adopted to reduce the cost of production and thus bring the automobile within the purchasing range of fresh classes of the community. Whereas in America the cost of an automobile represented 50 days' labor on the part of an average worker, in France it repsented at least 200 days' labor.

Traffic congestion was no obstacle to automobile development in France, declared Citroen, for it only existed over three or four square miles of the center of Paris during three hours of the day, and could be overcome by proper traffic laws, while in other cities and on the highways of France there was no problem. Garage difficulties in cities could be overcome, and they did not exist on farms, where the biggest market was to be found.

Citroen explained to his audience the advantages, from a commercial standpoint, of the small amount of stocks American factories maintained, compared with the immense amount of capital tied up in Europe under the system of a multiplicity of factories making a big range of models and changing their design at frequent intervals. He also sought to dispel the fear that one big factory constituted a danger to supply firms by reason of the possibility of orders suddenly being switched elsewhere or of the factory starting out to manufacture the parts themselves.

Forced to Make Parts

So far as he was concerned he had gone into production on proprietary articles only when the supply firms had shown themselves unable to keep pace with demand. In case of a falling off in production it was easier for one big factory to give warning and prevent the accumulation of stocks than it was for a number of small factories to do the same.

André Michelin, of the Michelin Tire Co., Milltown, N. J., explained the practical advantages of Taylorized methods and maintained that they could be applied advantageously to French conditions. The gathering has aroused much interest in France, for it is the first occasion that American ideas have clearly been laid before any great number of leaders of the automobile industry.

Negotiations Under Way to Make Turner Tractor

MILWAUKEE, Nov. 19—The manufacture of Simplicity gasoline engines will be resumed at once, and prospects are that the Turner tractor will again be placed in production as the result of arrangements made by Lee M. Turner, formerly president of the bankrupt Turner Manufacturing Co., Port Washington, Wis.

At trustee's sale the assets of the Turner company were purchased by the Badger-Packard Machinery Co., Milwaukee, which has now resold the entire rights, jigs, patterns, fixtures, etc., for the Simplicity engine to Turner on behalf of a group of Cedarburg, Wis., business men for $10,000.

Negotiations for the tractor rights are under way. Turner is now associated with the E. & W. Manufacturing Co., Cedarburg, manufacturing gas engines, contractors' hoists, concrete mixers, trailers, etc., and the Simplicity operation will be conducted in the E. & W. works, which is adding new machinery for this department.

Standardization Aid Is Sought Overseas

Movement Started to Convert Buyers of American Cars to Battery Ignition

NEW YORK, Nov. 20—The Foreign Trade committee of the National Automobile Chamber of Commerce, of which John N. Willys is chairman, has started a movement that is designed to convert the importers of American cars to the use of battery ignition only. The step is urged with the idea of reducing costs and also standardizing production.

At present, American manufacurers building for foreign trade are faced by four production changes—right drive and magneto, right drive and battery, left drive and magneto and left drive and battery. It is desired to reduce this to three by eliminating left drive and magneto.

To bring this about the committee is sending out for publication in countries which are heavy importers of American cars an article which contains the views of the committee on the subject and which recommends the use of battery ignition on all automobiles shipped abroad after July 1, 1924. This statement reads as follows:

Sets Date as July 1, 1924

The majority of members of the National Automobile Chamber of Commerce, U. S. A., feeling that the careful and intelligent users of cars throughout the world are best served if the full benefits resulting from standardization can be achieved, recommend the use of battery ignition on all automobiles shipped abroad after July 1, 1924.

Experience shows that battery ignition has proved successful in all territories where it has been used and it seems that the proper time has arrived to give the automobile users in all parts of the world the benefits that result from standardization on this modern system of ignition.

Servicing of batteries has greatly developed during the last few years as a result of better organization and supervising operations in most countries. It has become more accessible as well as more efficient; and facilities heretofore inadequate in outlying sections are to be improved materially in the very near future.

As a result, the number of isolated places in which any possible inconvenience affects only a small number of users in extremely remote sections will become more limited, whereas the marked benefits of standardization that are derived in lower costs to a large number of owners of automobiles immediately reflect to the advantage of all.

PUBLIC VISITS FORD PLANT

MILWAUKEE, Nov. 19—For the first time since Ford established an assembly branch plant in Milwaukee, the public was permitted to enter all departments from Tuesday, Nov. 13, to Saturday, Nov. 17, and inspect the production of Ford cars at the rate of one every 2½ minutes, or 200 a day. The factory was open to the public from noon to 9.30 P.M. each day.

Midwestern States Show Smaller Sales

October Decline in Indiana Is 17 Per Cent, and in Illinois 3 Per Cent

CHICAGO, Nov. 21—Passenger car sales continued to decline in both Illinois and Indiana during October, and particularly so in Indiana, which shows a decrease of 17 per cent as compared with September, while in Illinois the loss was only 3 per cent. Sales reached the peak in Illinois in May, and in Indiana in April.

October sales in these States decreased 43 per cent for Indiana and 48 per cent for Illinois from the high figures of the year, and the monthly average was reduced from 10,552 and 15,756 to 10,282 and 15,304 respectively.

As compared with the high month, Fords in Indiana showed a loss of 36 per cent and in Illinois 32 per cent. There was a gain, however, in Illinois for October of 9 per cent over the preceding month, but in Indiana the loss was 12 per cent, and Ford sales reached the lowest point of any month during the year, except January and February. For the first ten months of the year Ford sold 52 per cent of all cars in Indiana and made 42 per cent of the total sales in Illinois.

Comparison With Peak Month

The following figures indicate losses in other classes of passenger cars as compared with the peak month:

	Per cent
INDIANA	
Medium Price	54
High Price	52
Low Price (excluding Ford)	55
ILLINOIS	
Medium Price	57
High Price	43
Low Price (excluding Ford)	57

During October, 28 per cent of all passenger cars sold in Illinois were absorbed by Cook County, in which Chicago is located. In Indiana, Marion County, in which Indianapolis is the principal city, took 15 per cent of the total.

Following are the detailed figures for the first ten months of 1923:

INDIANA

Month	Fords	Low priced excluding Fords	Medium priced	High priced
Jan.	3,871	697	1,138	164
Feb.	4,206	818	1,131	206
March	7,426	2,451	3,375	342
April	6,445	2,917	3,950	498
May	5,610	2,888	3,893	343
June	5,120	2,858	3,561	249
July	4,762	2,349	2,530	258
Aug.	6,733	2,103	2,395	199
Sept.	5,404	1,812	2,094	174
Oct.	4,719	1,315	1,654	163
Total	54,296	20,208	25,721	2,596
ILLINOIS				
Jan.	4,574	1,380	4,053	1,013
Feb.	4,183	1,031	3,093	698
March	5,444	2,190	4,317	685
April	7,994	4,101	7,225	930
May	8,199	4,618	7,879	973
June	6,735	4,597	6,262	780
July	8,332	4,105	6,732	839
Aug.	8,428	2,348	4,694	714
Sept.	5,228	1,623	4,281	531
Oct.	5,729	1,971	2,970	568
Total	64,846	28,964	51,506	7,731

These statistics were compiled from data furnished by Robinson's Advertising Service, Springfield, Ill., and Indianapolis Automobile Trade Association, Indianapolis.

New Cars in New York Gained Over September

NEW YORK, Nov. 21—October registrations of new cars showed an increase over September in both the low and medium and high priced cars, according to the Automobile Sales Analysis published by Sherlock & Arnold.

Total registrations for the ten months of this year in the low and medium priced lines are 72,184, as against 58,541 in the same period in 1922, and 39,307 in the ten months of 1921.

In the high priced line, registrations for the first ten months of this year aggregate 7349 as against 6246 for that period last year, and 3991 in 1921.

Two cars in the low and medium priced field show registrations in excess of 10,000, three others are greater than 4000 and eleven others are more than 1000. The lead in the high price field is held by two cars with registrations greater than 1500.

Recapitulation by months for this year is as follows:

	Medium and Low Priced	High Priced
January	2,803	212
February	2,775	606
March	8,050	821
April	11,050	1,180
May	11,220	1,059
June	9,699	815
July	9,127	760
August	6,458	542
September	5,430	553
October	5,572	801
TOTAL	72,184	7,349

St. Louis Registrations Exceed Total of 100,000

ST. LOUIS, Nov. 20—The number of automobiles in use in St. Louis passed the 100,000 mark during October and there are now 100,200 passenger cars licensed in this city, or 22,522 more than were licensed during the whole year of 1922. Trucks licensed number 16,456, or 1079 more than were licensed during 1922.

9448 FORD DEALERS IN U. S.

DETROIT, Nov. 21—The total of authorized Ford dealers in the United States is now 9448, a gain since Jan. 1 this year of 432. In addition, there are 22,000 Ford service stations. Ford authorized foreign dealers number approximately 3800 and service stations approximately 7000.

1924 European Race to Be Run in August

Conditions Are Similar to Those Governing Last French Grand Prix

PARIS, Nov. 10 (by mail)—A piston displacement of 122 cu. in., complete freedom regarding the use of supercharger devices and two-stroke engines, a minimum weight of 1433 lb. empty, a distance of 500 miles, two men aboard with seats staggered not more than 12 in. are the essential conditions of the rules governing the 1924 European Grand Prix road race, to be held in France on Aug. 5 or 6.

Except for its title and the body responsible for its organization, this race does not differ from the last French Grand Prix held at Tours. The International Association of Recognized Automobile Clubs has charge of the race, with the technical committee composed of four members of the Automobile Club of France and a delegate from each country represented in the race. Entry is by invitation, it being understood that no call will be sent out to Austria or Germany.

No decision has yet been made regarding the place at which the race will be held. Among the four or five candidates the favorite is Deauville, which possesses a 10-mile course, is prepared to offer a substantial subsidy and has the advantages of good hotel accommodation and a big, wealthy class of holiday makers.

France, Italy and England are certain starters, with American entries anticipated. Among those who are definitely known to have decided to race are Delage, Voisin, Rolland-Pilain and Bugatti. The Fiat Co. will enter four cars, three of them to be handled by Felice Nazzaro, Bordino and Salamano; the Italian Alfa-Romeo Co. will enter a team, and Sunbeam is looked upon as the only British contestant.

The course selected for the 122 cu. in. race will also be used for a national endurance contest on a limited gasoline allowance, comprising reliability under day and night running.

WISTRAND RESUMES

GALVA, ILL., Nov. 20—The Wistrand factory is resuming operation with a few changes in its management as the result of the reorganization. The foundry department has been closed, and hereafter gray iron and malleable castings will be purchased from out-of-town plants. Practically all departments except the foundry are resuming with normal crews.

FORD PRODUCTION FOR WEEK

DETROIT, Nov. 20—Ford production for the week ending Nov. 13 totals 39,177 cars and trucks, 18,037 Fordson tractors and 115 Lincoln cars.

Buenos Aires Show Makes $400,000 Sales

Big Attendance Keeps Doors Open Two Days Beyond Scheduled Closing

BUENOS AIRES, ARGENTINA, Nov. 21 (*by cable*)—Due to the record-breaking attendance, estimated at 75,000, the annual Buenos Aires automobile show did not close until yesterday, instead of the eighteenth, thus having continued for eleven days.

Although the majority were from Buenos Aires, among the visitors were many dealers and enthusiasts from all parts of the Republic and neighboring countries. The attendance included President Alvear, as well as public officials and leaders in the social, business and professional life of the nation.

The show was larger and better in every respect than that of last year. Owing to the exceptional interest, local dealers and distributors would have utilized 40 per cent more space if it had been available.

Forty-Seven American Cars

The exhibits consisted of eighty-eight passenger cars, representing forty-seven American manufacturers, twenty-seven French, seven Italian, four German and four British. Spanish, Belgian and Argentine cars were one each.

Of the seventeen truck manufacturers, nine were American and eight European. The Tire Importers Association contracted space for all of its members, of which six are European and six American. The eleven city sales agencies of the Ford occupied a separate building.

More than 50 per cent of the motorcycle, accessory and lubricant lines exhibited were of American original, although European and local manufacturers were well represented. Four Argentine custom body building exhibitions received much commendation.

The approximate value of all the exhibits was placed at 4,000,000 pesos, while sales made during the show are estimated at 1,200,000 pesos. (This approximates $1,300,000 United States for the exhibits and $400,000 for sales). Long lists of prospects were obtained by most of the exhibitors.

Changes in Body Design

The elegance of the lines and the perfection of equipment on even the moderate priced lines were notable features of the exhibition. More changes were noticeable in the body designs than in mechanical and chassis features.

Closed cars were more popular than heretofore.

Daily attractions during the show took the form of special music, moving pictures and vaudeville attractions.

Credit for the show, which is being hailed here as an epoch making event in the development of the industry, should be given to the Automovil Club Argentino, which organized the showing, and to the aid extended by the press association.

The prospects for the summer sales season are excellent.—M. T. MEADOWS.

FINANCIAL NOTES

Hudson Motor Car Co. has declared the regular quarterly dividend of 75 cents a share, payable Jan. 2 to stock of record Dec. 20.

Post Office Department to Test Electric Trucks

WASHINGTON, Nov. 20—The Post Office Department will undertake thorough tests of 2-ton electric trucks in comparison with gasoline-propelled of similar capacity, and in identical service, to determine which type is the more economical in rather congested city traffic.

Electric trucks to be used will include Walker, Ward and Commercial makes. Half of these will be equipped with lead and half with Edison batteries. Tests will be made under the supervision of engineers of the department, and the trucks will carry observers.

Post Office engineers are much interested in balloon tires of a type midway between ordinary cords and the four-ply passenger-car balloon tires. Types under test have six plies and are similar to taxicab tires now in use.

365,107 Cars and Trucks Manufactured in October

WASHINGTON, Nov. 21 — Figures compiled by the Department of Commerce based on reports received from 186 manufacturers place October production of automobiles and motor trucks at 365,107.

Production for three years is as follows:

Passenger Cars

	1921	1922	1923
Jan	.....	*81,696	223,819
Feb.	.....	109,171	*254,773
March	.....	*152,962	*319,770
April	.....	*197,224	344,639
May	.....	*232,462	*350,410
June	.....	263,053	*337,362
July	*165,616	*225,086	297,330
Aug.	*167,756	*249,492	*314,373
Sept.	144,670	*187,694	*298,911
Oct.	*134,774	*217,566	334,966
Nov.	106,081	*215,352	.....
Dec.	*70,727	*208,010	.....

Motor Trucks

	1921	1922	1923
Jan	.....	*9,576	*19,720
Feb.	.....	*13,350	*22,161
March	.....	*20,022	*35,260
April	.....	*22,640	*38,056
May	.....	*24,097	*43,678
June	.....	*26,298	*41,145
July	*11,136	*22,046	*30,663
Aug.	*13,400	*24,692	*30,829
Sept.	*13,978	*19,462	*28,632
Oct.	*13,149	*21,795	*30,141
Nov.	*10,487	*21,949	.....
Dec.	*8,656	*20,354	.....

*Revised.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

Last week's developments were highly irregular, the effects of foreign complications being more in evidence than heretofore. There were signs of an improved tone in some wholesale markets, but stock and commodity prices in general worked lower.

Prices of wheat, corn and pig iron weakened slightly, while cotton continued firm, touching a new high point for the year at 35.20 cents a pound on Monday of this week.

Car loadings during the week ended Nov. 3 numbered 1,035,776, comparing with 1,073,865 for the preceding week and 970,851 for the corresponding week last year.

Preliminary figures from the Department of Commerce show merchandise exports during October amounting to $402,000,000, against imports of $303,000,000, leaving an export balance of $99,000,000. Both exports and imports were greater than in September, the former having gained $21,000,000 and the latter $49,000,000. As compared with October a year ago, exports show an increase of $31,000,000 and imports an increase of $27,000,000.

Petroleum Output Declines

Production of crude petroleum for the week ended Nov. 10 averaged 2,238,750 barrels a day, a decline of 17,100 barrels from the average for the preceding week, and of 41,950 for the year's peak in the week of Sept. 9, but an increase of 598,350 barrels from the average for the corresponding week last year.

The Fisher index of wholesale commodity prices dropped two points last week, reaching a new low point for the year at 152. This compares with 157 for the week ended Oct. 12, 153 for the week of Aug. 17, and 168 for the week of April 6. The wholesale price index of the Bureau of Labor Statistics is 153 for the month of October, comparing with 154 for September, 150 for August, and 154 for October, 1922.

Discounts by Federal Reserve banks declined $26,300,000 during the week ended Nov. 14, while purchased bills increased $20,400,000. Discounts secured by Government obligations declined $4,100,000 and "other bills discounted" $22,200,000. Total deposits increased $73,000,000, members' reserves gaining $48,500,000 and Government deposits $26,400,000. Circulation of Federal Reserve notes fell off $2,500,000.

ERIE TIRE PLANT SOLD

TOLEDO, Nov. 21—The plant and assets of the Erie Tire & Rubber Co. at Sandusky have been sold by Special Master Fordyce Belford to Charles T. Wilson, trustee, representing creditors, for $330,100. It is expected that the claims will total more than $500,000, so that creditors probably will receive less than 50 cents on the dollar. A reorganization of the company is planned.

New Stevens-Duryea Company Organized

Leases Plant of Rauch & Lang, for Which It Will Produce Electrics

SPRINGFIELD, MASS., Nov. 22—Stevens-Duryea Motors, Inc., has been incorporated under New York laws to succeed Stevens-Duryea, Inc., manufacturer of Stevens-Duryea cars, whose plant and assets were purchased recently by Ray M. Owen and associates.

At the head of the new company is Ralph R. Owen, brother of the chief of the purchasing syndicate who has been elected to the presidency. R. W. Stanley, who was a member of the syndicate, factory manager of Stevens-Duryea, Inc., under the receiver and who also is president of the Rauch & Lang Co., is vice-president and general manager, while Ray M. Owen is secretary and treasurer.

The new company has leased the plant of the Rauch & Lang Co., adjacent to the Stevens-Duryea plant, and will manufacture not only Stevens-Duryea cars there but will also produce Rauch & Lang electrics for the Rauch & Lang Co. The big plant of the old company will be disposed of at private sale through Joseph P. Day and Cross & Brown, Owen finding that the R & L plant is sufficiently large for the manufacture of both the gasoline and the electric cars, there being 125,000 sq. ft. of space available.

Production of both types of cars will continue and the outlook is said to be most encouraging.

Ray Middleton, formerly sales manager of the Lexington company and more recently its New York agent, will be sales manager of the Stevens-Duryea.

Industry Is Leading Manufactured Exports

WASHINGTON, Nov. 20 — Another notable achievement for the automobile industry is found in the announcement of M. H. Hoepli, acting chief of the automotive division of the Department of Commerce, that the exports of cars, trucks and parts from the United States in the fiscal year 1922-1923 stand first among all manufactured products shipped from this country. Automobile products, Hoepli declares, are now exceeded only by five other commodities, none of which is classed as "manufactures."

Government figures for the foreign trade of the United States during the fiscal year just ended show that "automobiles and parts" occupy sixth place among all the commodities exported, being exceeded only by the following: Cotton, unmanufactured; mineral oils, refined; wheat, tobacco leaf and coal. In the export table they are considerably in advance of the other leading manufactured products, including cotton cloth, which now holds ninth place; iron and steel, which is sixteenth; and agricultural machinery, which is nineteenth.

Total value of automobiles and parts exported in 1922-1923 was $132,035,000, representing an increase of 467 per cent over the pre-war average for 1910-1914, and an increase of 72 over 1921-1922.

INDUSTRIAL NOTES

C. G. Spring Co. reports sales in September and October this year, the first two months of the company's new fiscal year, as being more than double those for the same two months in 1922. Sales in October this year exceeded the preceding month by 25 per cent. The company has taken over the plant of the Detroit Foundry Co. adjacent to its present property in which it will install forging machines and heat treating furnaces. This will give an additional 35,000 feet of floor space.

Thomson-Friedlob Manufacturing Co. of Peoria, Ill., has become the Thomson Manufacturing Co. through the retirement of Eli Friedlob, formerly associated with W. H. Thomson, who continues as president. The company manufactures Apex innering, a device which is fitted under regular piston rings of all types of gasoline engines and is designed to do away with piston slap and oil pumping, eliminating the expense of reboring and fitting new pistons.

Wausau Parts Manufacturing Co. has been incorporated at Wausau, Wis., with $50,000 capital to engage in the manufacture of automotive units, parts and equipment. A factory has been acquired and equipment is being installed. The principals are all prominent business men of Wausau and include Karl Mathie, W. L. Landon and W. F. Schofield.

Samson Tire & Rubber Corp. has broken ground for new factory units in Los Angeles which will almost double its capacity. In addition, the entire factory has been placed on a twenty-four hour basis. More than 50,000 additional sq. ft. of floor space will be provided by the new buildings.

Senators Told of Need for Model Traffic Law

WASHINGTON, Nov. 20—A model traffic law in the nation's capital, to be a pattern for all other American cities, was advocated at a hearing today by Thomas B. Henry of Detroit, president of the American Automobile Association, testifying before the Senate District Committee.

Traffic conditions in the United States, he told the committee, will soon reach the point when drastic action must be taken and a model law should be drafted for Washington in order that it might be patterned after by the hundreds of other cities that need it.

Dr. James W. Inches, formerly police commissioner of Detroit, outlined a system of traffic control before the committee. He is a strong advocate of one-way streets, declaring in his opinion that with the growth of the automobile all cities must adopt the one-way street plan.

METAL MARKETS

Announcement a few days ago that the sole domestic producer of aluminum has advanced contract prices 1 cent per pound overshadows in importance from the automotive metal buyer's point of view what few new developments have taken place in the steel market. The new aluminum prices: 26 cents for 98 to 99 per cent. virgin ingots, 27 cents for 99 per cent, 25½ cents for No. 12 alloy, and 36 cents for No. 18 gauge sheets, compare with the following set of quotations in vogue before the passage of the present tariff law: 19 cents for 98 to 99 per cent. virgin ingots, 20 cents for 99 per cent., 19 cents for No. 12 alloy, and 32 cents for sheets, denoting a rise since Sept. 21, 1922, of 4 to 7 cents.

The price prevalent in London on Saturday for 98 to 99 per cent. virgin ingots was 115 Pounds Sterling per gross ton, the equivalent at the rate of exchange in effect on that day ($4.28½ for cables) of 22 cents per pound. It is quite possible, in fact, highly probable that the London market will advance as the result of the upward revision of prices here. Importers in the New York market, confined at present to those bringing in British and Swiss aluminum, quote virtually the same prices as those named by the domestic producer, although a few transactions are reported to have been closed at ½ cent per pound concession from the new domestic price immediately following its announcement.

The advance denotes not merely the American producer's market supremacy, but, perhaps more important, confidence that the year 1924 will witness much increased demand, especially so from the automotive industries. In copper and brass products recently promulgated price advances are well maintained with a somewhat more active inquiry from automotive consumers than before, although the rise in copper quotations on which the higher levels for copper and brass products were based, was followed by a slight reaction. Very little change has come over the iron and steel markets. The leading manufacturer of low-priced passenger motor cars is reported to have put out inquiries for between 6,000 and 10,000 tons of steel bars.

While some shading of prices for black, blue annealed, and galvanized sheets is reported, sales managers of mills specializing in full-finished automotive sheets deny vigorously insinuations that the 5.35 cents basis has been encroached upon by shrewd buyers.

Pig Iron.—Much has been said in the last few days about greatly increased activity in the pig iron market. So far as purchases for account of automotive foundries are concerned, they have not been in evidence to any great extent. Prices continue at bargain levels, and in some markets really desirable tonages of malleable could be picked up at concessions, but melters are seemingly averse to committing themselves beyond their immediate needs at this time.

Aluminum.—Somewhat more activity is noted, chiefly consisting, however, of efforts by consumers to contract for their early 1924 needs at prices in vogue before the American producer's advance in prices. Negotiations of such a character are pending in many cases. The outside market supply is very light.

Copper.—Following splendid recovery, the European situation gave the market another setback. Domestic absorption of metal, however, is propitious.

Calendar

SHOWS

Jan. 5-12 New York, Annual Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Eighth Coast Artillery Armory.

Jan. 26-Feb. 2—Chicago, Annual Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

Jan. 26-Feb. 2—Chicago, Annual Automobile Salon, Hotel Drake.

Feb. 4-9—Chicago, Tenth Annual National Motorcycle, Bicycle and Accessory Show, Broadway Armory, under the auspices of the Motorcycle and Allied Trades Association, A. B. Coffman, secretary.

FOREIGN SHOWS

Nov. 22-Dec. 1—London, Motor Transport Exhibition.

Dec. 1-10 — Montevideo, Uruguay, Automobile Show, Buildings of the Rural Society.

Dec. 8-19—Brussels, Passenger Cars, Trucks, Airplanes and Motor Boats, Aviation Palace.

RACES

Nov. 29.—Los Angeles.

Aug. 5 or 6—France, European Grand Prix.

CONVENTIONS

Dec. 11-13—St. Louis, Convention of American Petroleum Institute, Hotel Statler.

Jan. 5—New York City, Annual Meeting, Automotive Electric Association.

Jan. 14-18 — Chicago, Annual Convention and Show of the American Road Builders' Association, the former to be held in the Congress and the latter in the Coliseum.

May, 1924—Detroit, International Motor Transport Congress under the auspices of the National Automobile Chamber of Commerce.

S. A. E. MEETINGS

Dec. 13—Metropolitan Section, Vehicles for Package Delivery.

Jan. 22-25—Annual Meeting of the S. A. E.—Detroit.

Feb. 14 — Metropolitan Section, Vehicle Depreciation.

March 13—Metropolitan Section, Replacement Parts and Accessories.

April 17—Metropolitan Section, Fleet Maintenance, F. W. Winchester.

May 15 — Metropolitan Section, What Roads and Steels Do to Automobiles.

Admiral Moffett Sees Big Aviation Future

WASHINGTON, Nov. 20—Commercial aviation in the United States will be only a matter of a few years now, due primarily to the development of the airplane engine and the introduction of the rigid dirigible airship, such as the Shenandoah.

Such was the belief expressed by Admiral William A. Moffett, chief of the Bureau of Aeronautics of the Navy Department, in an address before the National Geographic Society here.

The dirigible, he declared, is an all-weather ship and as such will be practical for both passenger and freight service. "They can be made and used with safety," he said, "and it is my belief that their practical use will be a matter of a very few years.

The speaker stated that in his opinion, and in the opinion of the Navy experts, the great dirigible Shenandoah, or its sister ship, which is expected from Germany, can fly to the North Pole and back with ease. He indicated that after further scouting with the Shenandoah the Navy Department might approve such an expedition.

Admiral Moffett's address was illustrated with slides and motion pictures, showing the development and pioneer work being done by the Navy in the aviation field. The automobile industry, he declared, has done more than any other agency to further this work, and he paid tribute to the industry's engineers engaged in the work.

Industrial Tractors Classified as Trucks

SPRINGFIELD, ILL., Nov. 20—Tractors are classified as motor trucks under new Illinois legislation, effective Jan. 1, 1924, which imposes a license fee upon these as other motor vehicles, while truck fees have been increased to a maximum of $150 with trailers also included in the list of license-requiring vehicles.

Agricultural tractors are exempt, but commercial motive power machines whenever used on public roads must be supplied with a license. Louis Emmerson, Secretary of State, explaining the new schedule, said: "The action of the Legislature resulted from the unusually heavy loads which travel over the highways, resulting, of course, in unusually heavy maintenance expense."

License for passenger cars is unchanged from 1923. Commercial trucks last year paid a maximum fee of $60. The fee scale is determined by the gross weight and carrying capacity of the trucks and tractors.

Missouri Finds Revenue Insufficient for Roads

ST. LOUIS, Nov. 20—At a special meeting of the highways committees of the House of Representatives and the Senate, Governor Hyde said that unless more revenue is forthcoming next year it will be necessary to slow up the road-building program. Revenue available for the extension of the road-building campaign for next year amounts to only $2,000,000, although contracts have been let for the expenditure of $24,000,000.

To meet the situation the Governor plans an extra session of the Legislature to consider ways of raising the needed funds. It is expected that the session will be held early next month.

Two ways have been proposed to raise the money, one a 1-cent per gallon tax on gasoline and the other a flat increase of $3.50 on each automobile license issued in the State. Under either system enough money would be provided to permit the issuance of $15,000,000 in bonds for the next three years.

Roy F. Britton, representing the Automobile Club of Missouri, with 30,000 members, declares his organization will recommend both the tax on gasoline and an increase of State license.

MILWAUKEE BODY MAKERS ELECT

MILWAUKEE, Nov. 20—At the annual meeting of the Vehicle Manufacturing Association, composed of Milwaukee firms making automobile and truck bodies, repair work, trimming, etc., D. C. Broenen was elected president; Fred Zacher, vice-president; E. C. Bruhy, secretary, and A. C. Habhegger, treasurer. Directors are Louis Schneller, Fred C. Barkow and A. J. Monday.

Towns in Southeast Buy More Equipment

ATLANTA, Nov. 20—Automotive accessory and equipment sales throughout the Southeast have been remarkably heavy the last three or four weeks, Atlanta wholesalers advise, with a majority of the retail dealers having ordered considerably larger stocks for the holiday and Christmas trade this season than was the case last year.

Most of the larger jobbers state that their volume has been the best for this season it has ever been before, and that there are indications this will prove an accessory and equipment Christmas in the Southeast.

Business in the smaller towns has been unusually good, with sales estimated at around 50 to 60 per cent greater than they were last year, while in the larger cities the increase, jobbers state, appears to have been around 20 to 25 per cent.

Cotton prices now having climbed above 32 cents per pound at the southern spot markets, retail dealers are heavily replenishing their stocks in the smaller towns, and orders by mail for immediate delivery recently have been unusually heavy.

The Atlanta retail trade is carrying 15 to 20 per cent larger stocks for the holiday trade this season than last year, and about the same ratio is believed to prevail over the entire Southeast, except in the smaller communities, where the dealers are carrying at least 25 to 30 per cent larger stocks.

Arvac Plant in Anderson Bought by Remy Electric

ANDERSON, IND., Nov. 20—Remy Electric Co. has purchased the plant formerly owned by the Arvac Manufacturing Co., builder of universal joints and other automotive parts, also of Anderson.

This purchase will give the Remy company 85,000 sq. ft. of additional floor space for the manufacture of starting, lighting and ignition equipment. Ten acres of ground adjoining the Arvac plant go with the deal.

It is expected to have this second plant in operation by the first of the year.